DEPARTMENTWIDE PROGRAM EVALUATION OF THE HAZARDOUS MATERIALS TRANSPORTATION PROGRAMS

FINAL REPORT

MARCH 2000

ONE DOT

WORKING BETTER TOGETHER

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of the

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Preface

On March 9, 1999, US Transportation Secretary Rodney E. Slater announced the formation of a multi-modal team to conduct a Departmentwide program evaluation to document and assess the effectiveness of the Department's hazardous materials transportation safety programs. It was conducted as part of the Secretary's ONE-DOT effort to help enhance the safety of the American people when hazardous materials are being transported commercially. This report on the DOT-wide Hazardous Materials Program Evaluation has been prepared in accordance with the schedule set out in Section IX, Program Evaluations, of the *DOT Strategic Plan 1997-2002*.

The program evaluation found that the Department's hazardous materials program is working reasonably well, but it needs to be improved through Departmentwide strategic planning and program coordination, more focused delivery, and better data. A number of additional issues were also identified requiring further assessment and analysis. DOT's senior leadership has already taken action to implement the recommendations contained in this report. They have agreed to establish an institutional capacity under the Associate Deputy Secretary and Director, Office of Intermodalism, to act as a central focal point to administer and deliver a DOT-wide hazardous materials program that will provide for more effective deployment of the Department's hazardous materials resources.

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Departmentwide Program Evaluation of the Hazardous Materials Transportation Programs

EXECUTIVE SUMMARY

OBJECTIVES

The objectives of the Departmentwide hazardous materials program evaluation are: (1) to document current hazardous materials movements, Operating Administrations'[1] programs, and program delivery and (2) to assess the effectiveness of the Department of Transportation's (DOT) overall hazardous materials program as it affects each step in the hazardous materials transportation process, from packaging manufacturer to delivery to the end user; recommend improvements; and, identify areas for further study. The evaluation is intended to allow the Department to determine the effectiveness of the current hazardous materials programs, including the effectiveness and efficiency of DOT's allocation of its hazardous materials resources.

RESULTS IN BRIEF

There are roughly 300 million hazardous materials shipments in the nation each year and the vast majority of these shipments arrive at their destinations safely. [2] In 1998, there were 15,322 incidents, including 429 serious incidents; 13 deaths; and 198 injuries. Although this is a relatively good safety record, given the number of shipments and movements, there remains the potential for catastrophic incidents in the transportation of hazardous materials where multiple fatalities, serious injuries, large-scale evacuations, and other costs to society could result. For example:

- Chemical oxygen generators on a commercial airliner ignited causing the crash of Valujet Flight 592 into the Florida Everglades in 1996 killing 110 passengers and crew.
- Unleaded gasoline spilled during unloading of a cargo tank in Biloxi, Mississippi, in 1998 resulting in 5 hazardous materials fatalities, the evacuation of over 80 people, and the closure of an interstate highway.

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[1] In this report, the term Operating Administrations refers to the United States Coast Guard, the Federal Aviation Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, and the Research and Special Programs Administration.

[2] All data used in the report that provides a measure of the volume of hazardous materials in transportation such as shipments, movements, and tons, represent domestic quantities only.

- Phosphoric acid being transported in intermodal freight containers on a barge were lost over the side or crushed in heavy seas in April 1998. Cleanup costs in the Morgan City, Louisiana, area totaled almost $1 million.

- A flatbed tractor-trailer hauling black powder in an intermodal freight container overturned on Interstate-95 in Springfield, Virginia, in June 1999, inconveniencing 250,000 highway users and costing society $25 million due to traffic delays even though there was no release of hazardous materials.

- Over 16,250 gallons of chlorine were released when a freight train derailed in Alberton, Montana, in April 1996 resulting in 1 fatality, 787 hospitalizations, 1,000 evacuations, and over $4.5 million in cleanup costs.

Total tons of hazardous materials produced are forecast to grow by 2 percent per year. Growth in the amount of hazardous materials transported by air and intermodally could be 4 times and 3 times faster, respectively, than the overall production growth. Therefore, the potential risk to the public may also increase unless effective safeguards are in place. The Department has responsibility for protecting the public from the inherent risks associated with transporting hazardous materials.

The Hazardous Materials Program Evaluation (HMPE) team found that DOT's hazardous materials program works reasonably well but needs to be improved. The hazardous materials program lacks the Departmentwide strategic planning and direction necessary to ensure effective deployment of resources, and there are not reliable and sufficient data upon which to make informed program decisions. The program evaluation's major findings were:

- DOT has not achieved a Departmentwide approach to implementing its hazardous materials programs. Overall, the program lacks sound strategic planning and coordinated DOT-wide direction. No institutional capacity exists in the Department for setting Departmentwide policy and program objectives, or coordinating budget and resource strategies. In addition, DOT's Strategic Plan does not highlight the risks associated with hazardous materials, and the importance of hazardous materials is not emphasized in four of the five Operating Administrations' individual safety programs.

- Shippers of hazardous materials generally receive less attention DOT-wide than carriers, yet they offer the greatest opportunity to improve safety. Shippers are a common element across the Operating Administrations, perform critical functions early in the transportation

stream, and can impact safety system-wide. Currently, shippers account for roughly only 5 percent of all hazardous materials inspections conducted by the Department, although some detailed shipper inspections can take several hours to several days.[3] Yet, analysis and public comment repeatedly identify the shipper, more often than the carrier, as the party most culpable for noncompliance with the Hazardous Materials Regulations (HMR). Shippers introduce hazardous materials into the transportation stream and their actions can affect the ability of carriers to safely deliver a product. The team recommends an institutional capacity to be responsible for planning and coordinating DOT-wide actions, including additional emphasis on shippers. Such a DOT-wide effort would have a more synergistic effect and should result in more efficient and effective use of resources.

- Human error continues to be the single greatest contributing factor in hazardous materials incidents and DOT has not been effective in changing this trend. The training requirements in the HMR need to be improved to change industry safety practices and ensure that those responsible for handling hazardous materials are adequately trained.

- DOT should develop a coordinated Departmentwide outreach program to increase the awareness of the traveling public. Passengers need to better understand the risks inherent in the transportation of hazardous materials they introduce into transportation. Passengers, often unintentionally, carry hazardous materials aboard a plane, train, ship, or bus, either in carry-on baggage or as stowed luggage. Also, drivers of passenger vehicles need to better understand the risks associated with placarded hazardous materials vehicles and gain an appreciation of the widespread consequences that could occur as a result of unsafe driver practices.

- DOT's lack of reliable data hampers program delivery decisions. DOT needs to have more reliable, accurate, and timely data to measure program effectiveness and make informed program delivery and resource decisions.

- The total amount of resources used by the Department to carry out the hazardous materials program is not easily identified. In fact, only one Operating Administration (the Research and Special Programs Administration (RSPA)) has a budget line item for its hazardous materials program. The budgets for the other Operating

[3] Chapter 6 of this report discusses the variance in time between shipper, carrier, and vehicle inspections.

Administrations' hazardous materials programs are less visible because they are combined in their overall safety programs.

The HMPE team recommends the hazardous materials program be improved by:

- Strengthening strategic planning and coordination by establishing an institutional capacity in the Department to administer and deliver a coordinated hazardous materials program with the authority to establish DOT-wide policy, program objectives, and priorities and focus budget and resource strategies. For example, if analysis of inspection and incident data revealed that improper preparation of closure devices on plastic drums was becoming a problem, the recommended institutional capacity would be able to develop DOT-wide objectives and strategies to address the issue.

- Enhancing program delivery by identifying and focusing more on high-risk or problem shippers, more effectively using all available tools at DOT's disposal, and identifying other critical points in the transportation stream for program focus. For example, problem shippers, such as those with many hazardous materials incidents, may be targeted for inspections, while infrequent hazardous materials shippers may benefit more from outreach.

- Using strike force inspections to cross-train inspectors as well as enforce regulations. Strike force operations concentrate inspectors from the Operating Administrations and other Federal, state, and local agencies at intermodal locations for a specific time period to conduct hazardous materials inspections of more than one mode of transportation that use the targeted location. In addition to enforcing compliance, strike force operations can be used to train inspectors from one Operating Administration on the issues, problems, and regulatory requirements of another Operating Administration.

- Improving outreach aimed at the traveling public by better educating passengers on what materials are hazardous and should not be carried aboard, or placed in stowed luggage on, planes, trains, and buses, and better educating the driving public on the dangers associated with hazardous materials carried over the nation's highways.

- Strengthening the training regulations by tasking the institutional capacity to work with RSPA, the other Operating Administrations, and industry to identify ways to ensure hazardous materials employees are adequately trained to carry out their jobs in a safe manner.

- Enriching the quality of hazardous materials data by tasking the Bureau of Transportation Statistics to work with the Operating Administrations to determine data needs, collection strategies, and analytical techniques.

- Assign to the new institutional capacity the task of addressing several regulatory and programmatic issues identified by the team during the program evaluation, but which were too complex or time consuming for this program evaluation. These issues are described later in this executive summary.

BACKGROUND

Safety is Paramount

Types of hazardous materials range from relatively innocuous products, such as hair spray and perfumes, to bulk shipments of gasoline by highway cargo tanks and anhydrous ammonia by railroad tank cars. Annually in the United States, there are at least 300 million hazardous materials shipments totaling approximately 3.2 billion tons. In 1998, there were roughly 15,000 incidents related to hazardous materials shipments resulting in 13 deaths and 198 injuries.[4] This is a relatively good safety record given the amount of hazardous materials traffic. There remains, however, the potential for hazardous materials incidents with catastrophic consequences. In many respects, the hazardous materials program is analogous to aviation safety programs because the devastating consequences that a single mishap can produce are an unacceptable outcome.

High risk, low probability events do not lend themselves to traditional cost-benefit analysis for deciding resource allocations. In these cases, DOT strives for zero tolerance and tries to organize its efforts and resources to achieve the goal as efficiently as possible. The public has the right to expect the government, shippers, and carriers to make every reasonable effort to protect it against even the remote possibility of a hazardous material disaster.

From 1993 through 1998, the annual number of hazardous materials incidents reported to DOT averaged 14,488 with relatively little variation in the number each year. During the same period, serious incidents averaged about 418 and ranged from 357 in 1993 to a high of 464 in 1996. RSPA defines a serious incident as one involving: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or

[4] As of February 2000, 1999 data were not available.

derailment resulting in the release of a hazardous material.[5] DOT's Performance Plan sets a goal of 411 or fewer serious incidents for the year 2000. Table 1 shows the number of, and consequences resulting from, serious incidents for 1990 through 1998.

Table 1
Serious Hazardous Material Incident History From 1990 Through 1998

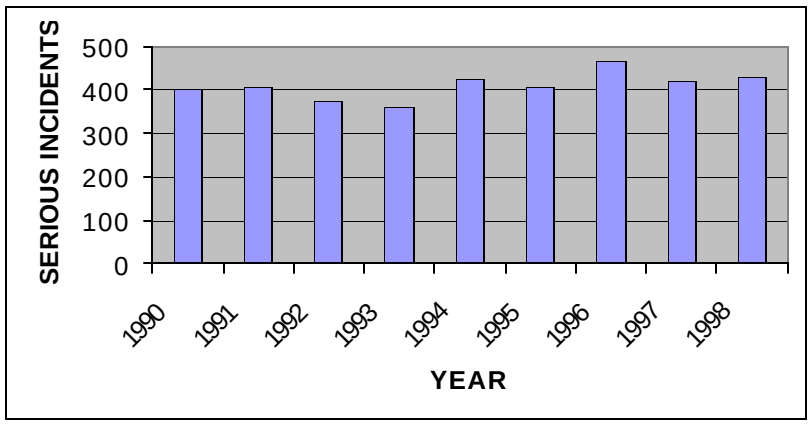
Year	Total Reported Incidents	Number of Serious Incidents	Number of Fatalities	Number of Injuries	Number of Persons Evacuated	Amount of Property Damage
1990	8,879	**402**	8	423	12,123	$32,353,276
1991	9,110	**403**	10	439	10,502	$38,350,611
1992	9,310	**375**	15	600	29,186	$35,164,057
1993	12,830	**357**	15	627	18,237	$22,801,551
1994	16,087	**429**	11	577	18,398	$44,185,413
1995	14,743	**409**	7	400	11,444	$30,903,281
1996	13,950	**464**	120[1]	1,175[2]	19,556	$46,849,243
1997	13,994	**417**	12	225	24,587	$33,393,504
1998	15,322	**429**	13	198	9,181	$45,497,550
Total	**114,225**	**3,685**	**211**	**4,664**[3]	**153,214**	**$329,498,486**

Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA Hazardous Materials Information System (HMIS) incident database as of October 21, 1999.

1. 110 deaths were the result of the ValuJet incident in 1996.
2. A single rail incident in Montana involving chlorine resulted in injuries to 787 people.
3. In summarizing serious incident injuries for the biennial report, RSPA combines hospitalization (serious) injuries with minor injuries.

Figure 1 shows the trend in serious incidents from 1990 through 1998.

Figure 1
Serious Incidents 1990-1998



Source: RSPA Biennial Report on Hazardous Materials Transportation and HMIS data as of October 21, 1999.

[5] To meet the definition of serious, the persons evacuated are to be part of "the general public" and not transportation employees.

DOT Safety Issues

In the Hazardous Materials Transportation Act of 1974, Congress stated its intention to improve the regulatory and enforcement authority of the Secretary of Transportation to protect the nation against the risks to life and property, which are inherent in the transportation of hazardous materials in commerce.[6] The Act allowed the Secretary to draw together previously fragmented regulatory and enforcement authority and provided the flexibility to organize the hazardous materials programs within DOT. The Secretary delegated authority and responsibility to the Operating Administrations to establish their respective programs, but created no organization with authority to coordinate and oversee a DOT-wide hazardous materials program.

HMPE Established by Strategic Plan

In the Department of Transportation's Strategic Plan for 1997-2002, DOT stated that it would undertake a multi-modal hazardous materials program evaluation in FY 1999. The Government Performance and Results Act (GPRA) of 1993 requires Federal departments to prepare Strategic Plans to bring about a fundamental transformation in the way government programs and operations are managed and administered. One of GPRA's purposes is to improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction.

On March 9, 1999, the Secretary announced the formation of a Hazardous Materials Program Evaluation (HMPE) team to conduct a DOT-wide hazardous materials program evaluation. The HMPE team included at least one member from the United States Coast Guard (Coast Guard), the Federal Aviation Administration (FAA), the Federal Motor Carrier Safety Administration (FMCSA) (formerly a part of the Motor Carrier and Highway Safety core business unit within the Federal Highway Administration), the Federal Railroad Administration (FRA), the Research and Special Programs Administration (RSPA), and the Office of Inspector General. A number of prior reviews of the hazardous materials program have been conducted by an internal DOT task force, the U.S. General Accounting Office, and the Transportation Research Board.

The HMPE team concentrated its efforts on cross-modal hazardous materials. Cross-modal hazardous materials activities are covered by Title 49 Code of Federal Regulations (CFR) related to rulemaking and hazardous materials program procedures, and the HMR, 49 CFR Parts 171-180, which govern the packaging and safe transport of hazardous materials by air, highway, rail, and water. Cross-modal movements increase the risk of an incident occurring because these

[6] Public Law 93-633

movements involve multiple handlings (loadings and unloadings) by transportation providers, and the majority of hazardous materials incidents are attributed to human error. Figure 2 depicts the numerous movements and handlings that can occur in only one shipment of hazardous materials.

Figure 2
Depiction of Air Shipment Requiring Multiple Movements

The program evaluation did not include single-mode movements of hazardous materials that are not governed by the HMR, specifically, bulk shipments by water (involving only the Coast Guard) and pipeline shipments (involving only RSPA).

The HMPE team reviewed hazardous materials legislation and regulations; analyzed mission and function statements; reviewed prior internal and external reports; and interviewed hazardous materials managers and field personnel. In addition, the HMPE team analyzed responses to questions published in a Federal Register Notice (FR Doc. 99-17175) and results of focus group meetings; reviewed the Department's and Operating Administrations' Strategic and Performance plans; analyzed work plans, budgets, resources, and incident data; and participated in field inspections and enforcement activities.

The HMPE team used data from 1990 to 1998 to identify trends. To determine current conditions, the HMPE team used 1998 data to the maximum extent possible. However, when 1998 data were unavailable, the HMPE team used the most recent official data. October 21, 1999 is the latest data that was used by the

HMPE team from RSPA's various databases. During February, the Operating Administrations with hazardous materials responsibilities and selected Secretarial Officers reviewed drafts of the report together with the executive summary and provided the HMPE team with their technical and substantive comments which were incorporated in the final report. The HMPE team met, at the direction of the Deputy Secretary, with senior Operating Administration and Secretarial office officials to decide on the attributes and placement of the institutional capacity.

FINDINGS

DOT's Hazardous Materials Programs Lack DOT-wide Coordination, Direction, and Strategic Planning

DOT is responsible for ensuring the safe transport of hazardous materials by setting standards, inspecting carriers, shippers, and packaging manufacturers, and providing planning and training grants to those responding to hazardous materials incidents. The Secretary has delegated his regulatory authority to RSPA and his enforcement authority to FAA, FMCSA, FRA, RSPA, and the Coast Guard. The HMPE team found the Department's current hazardous materials program could be improved in the areas of program management and program delivery. Specifically, the team found:

- No institutional capacity exists in DOT that is responsible for establishing Departmentwide policy and program objectives, and overseeing budget and resource strategies. Without Departmentwide direction and oversight, DOT is unlikely to deploy its resources as effectively as it could. For example, more benefit might be achieved from a coordinated outreach and education program designed for *infrequent* shippers (most of which are multi-modal shippers) with the resource support of all of the Operating Administrations than could be accomplished through the uncoordinated efforts of the individual Operating Administrations.

- Hazardous materials programs are not emphasized in the Strategic Plan. DOT's Strategic Goal for Safety does not describe how the Department's hazardous materials program will contribute to achieving DOT's safety goal, nor does it include any hazardous materials performance measures or candidate indicators. Except for RSPA, the lack of emphasis on hazardous materials in the strategic plan lessens the importance of hazardous materials in the Operating Administrations' overall safety programs.

Earlier studies reached the same conclusion about the need for better planning and direction:

In a September 1978 report the Secretary and Deputy Secretary agreed to a recommendation made by a Departmentwide team to establish a standing committee to provide a Departmental focal point for carrying out all hazardous materials programs.[7]

A 1981 NTSB report on hazardous materials incidents caused by trucks found that RSPA had been unsuccessful in coordinating the Operating Administrations' hazardous material programs because RSPA was unable to exert influence over the larger Operating Administrations.[8] The NTSB report found a need for clear and strong direction from the Secretary.

Yet, almost 20 years later, the HMPE team found that the hazardous materials programs still lack such direction. Each Operating Administration develops hazardous materials programs, priorities, strategies, and objectives independently of the other Operating Administrations and without DOT-wide coordination.

DOT's Hazardous Materials Program Delivery Could Be Improved

The HMPE team uses the term hazardous materials "program delivery" to designate the entire suite of activities undertaken by the Operating Administrations to increase compliance with the provisions of the HMR. Activities encompassed by program delivery include standards development, inspections, comprehensive assessments, compliance reviews, investigations, enforcement actions, civil penalties, training, and outreach.

Funding for the five Operating Administrations' hazardous materials programs supports five distinct enforcement and outreach programs resulting in an overall concentration on carriers. The five programs employ the equivalent of 256 hazardous materials field inspectors who are responsible for hundreds of thousands of shippers and carriers. In 1998, these inspectors conducted about 115,000 inspections, including 614 inspections of manufacturers of highway cargo tanks, rail tank cars, cylinders, fiberboard boxes, and drums; 5,228 shipper inspections; 19,299 carrier inspections; and, 89,633 railcar inspections.[9] Table 2 shows the number of inspections performed at each location where inspectors intervene in the transportation stream.

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[7] U.S. Department of Transportation, Deputy Secretary's Report of the Hazardous Materials Task Force, September 1978.

[8] NTSB Safety Effectiveness Evaluation, Federal and State Enforcement Efforts in Hazardous Materials Transportation by Truck, NTSB-SEE-81-2, February 1981.

[9] Not included are 133,000 roadside inspections of commercial motor vehicles carrying hazardous materials conducted by the states under FMCSA's grant program.

Table 2
Number of Inspections by Point of Intervention – 1998

Point of Intervention					
Agency	**Packaging/ Manufacturing**	**Shipper**	**Carrier/ Forwarder**	**Vehicles/ Railcars**	**Total**
FAA	N/A	208[1]	3,349	N/A	3,557
FMCSA	20	147	1,927	133,674[2]	135,768
FRA	134	3,617	5,124	89,633	98,508
RSPA	460[3]	1,256[4]	N/A	N/A	1,716
Coast Guard	N/A	0	8,899[5]	0	8,899
Total	**614**	**5,228**	**19,299**	**223,307**	**248,448**

1. Reflects only Repair Station Assessments conducted for 1998. The FAA did conduct hazardous material shipper inspections in 1998; however, this activity was not tracked.
2. Vehicle inspections performed by state resources under the Motor Carrier Safety Assistance Program.
3. Includes container manufacturers and cylinder retesters/reconditioners.
4. Includes shippers and shipper observations, freight terminals/docks, and exemption and approval holders.
5. Includes both vessels examined and intermodal freight containers inspected.

N/A means not applicable to the agency.
Source: Operating Administrations' Inspection Databases

The ONE-DOT HMPE team found program delivery could be improved by placing additional emphasis on (1) shipper inspections and outreach, (2) outreach programs for the traveling public, and (3) training for the hazardous materials community.

- *More emphasis should be placed on shippers.* Shippers introduce hazardous materials into the transportation stream and are responsible for correctly classifying the hazardous material. All subsequent compliance hinges upon proper classification. If a hazardous material is incorrectly classified, it cannot be packaged or labeled properly. Consequently, carriers and emergency response personnel will not be aware of the hazardous properties of the material. Focusing more on shippers helps ensure safe packaging and correct communication of the dangers of the hazardous material before it enters the transportation stream. The HMPE team found that 40 percent of violations discovered during carrier inspections can be traced to shippers and some unknown portion of another 37 percent could be shipper violations, but available information did not allow a further refinement. DOT should devote more effort toward identifying problem or high-risk shippers and directing more outreach and inspections to those shippers to reduce the number of noncompliant shipments being offered to carriers.

  The result of the HMPE team's analysis that shippers are more often at fault parallels the results of a 1993 report by the TRB.[10] TRB reported

[10] Transportation Research Board, National Research Council, Hazardous Materials Shipment Information for Emergency Response, Special Report 239, 1993.

that emergency responders expressed concern about the frequency of missing or incorrect placards and shipping papers (shipper responsibilities) at hazardous materials incidents.[11] Using Federal Highway Administration (FHWA) data reflecting 1992, TRB reported that during roadside inspections, violations of federal requirements for placarding occur in about 30 percent of the trucks inspected, and violations of shipping paper requirements occur in about 25 percent. FHWA fiscal year 1998 data are slightly worse with improper placarding found on 32 percent of the hazardous materials vehicles inspected and violations of shipping papers found during 26 percent of inspections. A 1989 General Accounting Office report on FRA estimated that 75 percent of all hazardous materials releases could be traced to safety problems at shipper facilities.[12]

The HMPE team's review of FAA data for the past 3 years showed that 88 percent (139 of 158) of FAA's significant penalty assessments, defined as $50,000 or more, were against shippers. These assessments were incident-driven: the cases were developed from inspections or investigations of shippers performed as a result of hazardous materials incidents reported by carriers. FAA found that these shippers were offering hazardous materials for transportation when they were not packaged, labeled, marked, classed, or in condition for shipment in conformance with the HMR. FAA also found that certain shippers were not ensuring that their employees were trained to properly package and handle hazardous materials. For example, in November 1999, FAA assessed a significant penalty against a shipper who offered for air transportation 525 cigarette lighters containing flammable gas. The lighters were in a fiberboard box and were not properly packaged, labeled, or marked. While a significant monetary assessment is indicative of its seriousness, additional emphasis via outreach and training, as well as inspections, could make a major contribution toward shipper compliance and transportation safety. The modal Operating Administrations currently focus on shippers in reaction to a violation. They should instead be more proactive and focus additional resources on high-risk or problem shippers.

- *Educating the traveling public.* The traveling public is largely unaware of the dangers of the hazardous materials they enter into the transportation system or actions they take on the nation's highways that

[11] Although placarding is a joint shipper/carrier responsibility, in the highway mode the shipper is required to provide the necessary placards (49 CFR 172.506).

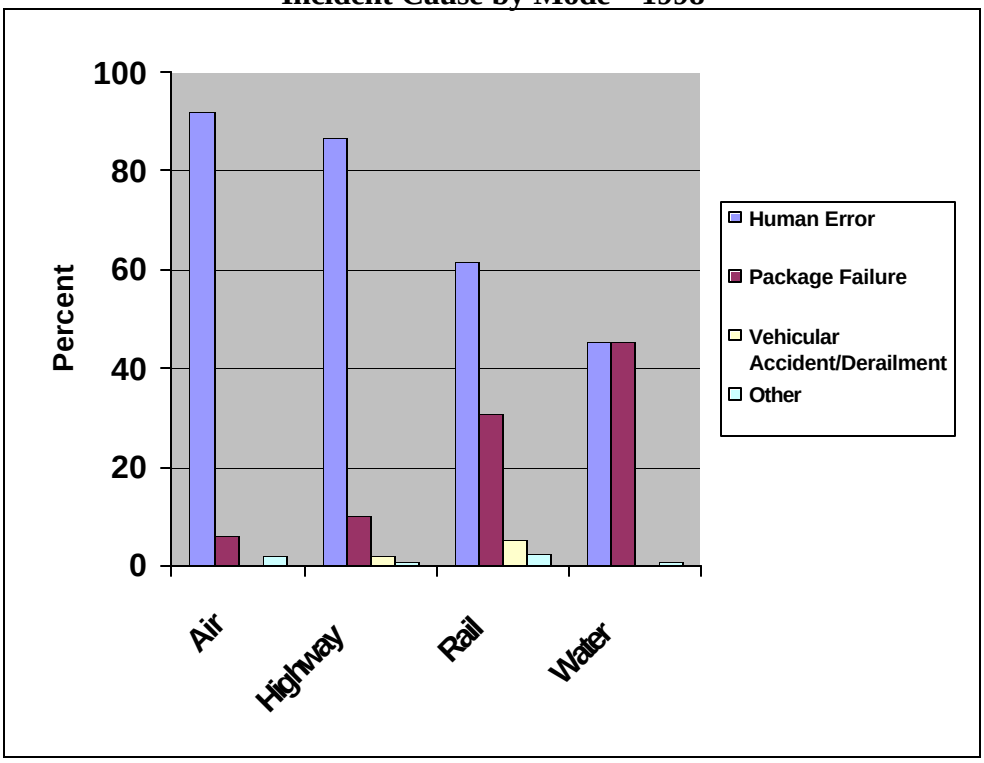
[12] U.S. General Accounting Office, DOT Should Better Manage Its Hazardous Materials Inspection Program, GAO/RCED 90-43, November 1989.

could affect safety. Except in the air mode, there are no requirements to warn the traveling public of the restrictions in the HMR on carrying hazardous materials in transportation. Recent outreach efforts, such as the distribution of a brochure titled "These Fly…These May Not," have reached only a small percentage of the traveling public. Every day millions of travelers board planes, trains, ships, and buses unaware of the dangers of hazardous materials they may be carrying. Another area requiring improvement involves passenger vehicle driver awareness. The majority of hazardous materials fatalities are the result of highway incidents. These fatalities are primarily related to accidents involving passenger vehicles and motor carriers hauling flammable liquids such as gasoline, and the fatalities are often non-truck occupants. The single largest "driver" reason for truck crashes is a failure of the driver of a passenger vehicle to yield. Drivers of passenger vehicles need to be made aware of the severe consequences that could occur as a result of their unsafe driving practices - the crash of a vehicle hauling hazardous materials.

The HMPE team also found that current notification rules warning the airline traveling public of the dangers associated with transporting hazardous materials are ineffective. The requirement to notify airline passengers may be satisfied by posting a sign at ticket counters and boarding areas. The sign must be legible and prominently displayed. HMPE team members usually had difficulty locating these required notices in airports, and often had difficulty reading them because they were mounted at knee level, in baggage scale areas, or had baggage blocking them.

- *Human error is a major contributor to hazardous materials incidents.* Human error continues to be the single greatest contributing factor in hazardous materials incidents and DOT has not been effective in changing this trend. RSPA data show that roughly 80 percent of hazardous materials incidents are attributable to human error. RSPA, with input from the other Operating Administrations and industry, should identify training improvements for hazardous materials employees and areas of the HMR training requirements needing improvement. For example, there is a requirement that hazardous materials employees be trained and tested for general hazardous materials awareness and job-specific safety requirements. However, there is no requirement that they be trained in order to demonstrate a minimum level of knowledge. Figure 3 depicts the modal breakdown by cause for 1998 hazardous materials incidents.

Figure 3
Incident Cause by Mode – 1998



Source: Source: RSPA HMIS incident database as of October 21, 1999.

Lack of Reliable Data Hampers Program Delivery Decisions

The Department is hampered by inadequate information with which to measure program effectiveness and make informed program delivery and resource decisions. DOT lacks reliable information on the amount and types of hazardous materials being shipped and parties who ship and carry hazardous materials. Furthermore, the Department does not receive reports on all hazardous materials incidents, and the reports the Department does receive are often incomplete and inaccurate.

- DOT does not have comprehensive information on hazardous materials manufacturers, carriers, freight forwarders, and shippers. For example, RSPA established a Unified Shippers Enforcement Data System (UNISHIP) database for the Operating Administrations to record and track shippers who have violated the HMR. This information would be helpful in identifying repeat offenders for inspection and in establishing the amount of a subsequent penalty. However, the Operating Administrations do not update the database with enforcement results frequently enough to make it useful to inspectors. An additional example is RSPA's registration database that only contains information

on one segment of the hazardous materials industry -- those shippers that ship or offer for shipment very dangerous or very large quantities of hazardous materials.

The information reported on DOT's reporting form for hazardous materials incidents, Form 5800.1, is often inaccurate and/or incomplete and, therefore, subject to misinterpretation during analysis. For example, the HMPE team analyzed the incident reports for 1996 to determine if our assessments of incident causes would match those of RSPA's contractor personnel.[13]

The HMPE team's results were markedly different than RSPA's. RSPA reported that package failure was the cause of 15.4 percent of all incidents versus the HMPE team's analysis of incident report data that determined a rate of 34.6 percent. The HMPE team also found three serious incidents that were not included in RSPA's database. Table 3 compares RSPA's causal data with the HMPE team's analysis.

Table 3
Distribution of Incident Causes

Cause	RSPA Determined Cause (percent of total)	Program Evaluation Team Determined Cause (percent of total)
Human Error	80.7	61.0
Package Failure	15.4	34.6
Vehicle Accident/Derailment	2.4	2.6
Other	1.5	1.8
Total	**100**	**100**

Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident remarks subsystem report for 1996.

In a 1981 report, GAO stated that, historically, the Department of Transportation did not have the critical information necessary to manage its hazardous materials program.[14] The HMPE team found this problem still exists almost 20 years later. Furthermore, no single entity within the Department has overall responsibility to develop and execute a data/information plan or analyze the data for use in directing the Department's hazardous materials program.

The Department is hampered by the lack of reliable, accurate, and timely information on which to evaluate program effectiveness and base

[13] 1996 was selected because it is DOT's baseline year for the hazardous materials performance goal.

[14] U.S. General Accounting Office, Programs For Ensuring The Safe Transportation of Hazardous Materials Need Improvement, GAO/RCED-81-5, November 1980.

program delivery decisions. A more complete and accurate collection and analysis of data would permit the Department to effectively measure its overall effectiveness, issue and implement proactive safety regulations, develop risk management methodologies, and make effective resource deployment decisions.

- The amount of DOT resources (both staffing and budget) actually used to carry out the hazardous materials program is not readily known by the Department. Only one Operating Administration has a separate budget line item for hazardous materials, and the HMPE team had difficulty determining resources applied to the hazardous materials program DOT-wide.

CONCLUSIONS AND RECOMMENDATIONS

Strategic Planning and Program Direction

The HMPE team has concluded that the Department has not taken a DOT-wide approach in administering the hazardous materials program. The Department lacks strategic planning and a coordinated DOT-wide program direction for hazardous materials. As a result, the Department is unlikely to improve and, because of forecasted growth, may not maintain the existing level of safety in hazardous materials transportation. To achieve a ONE-DOT approach to hazardous materials safety, the Department should:

- Establish an institutional capacity, complementary to the Operating Administrations at the Departmentwide level, to facilitate program coordination and direction to provide for more effective deployment of DOT's hazardous materials resources. The institutional capacity would administer and deliver a Departmentwide hazardous materials program to strengthen strategic planning, program coordination, and program delivery. It would have the authority to establish DOT-wide policy, program objectives and priorities, and focus budget and resource strategies. A Departmentwide hazardous materials program can best be instituted by delegating authority to a new or existing entity to be responsible for the program. Essential attributes of the new institutional entity should be to:

    - serve as the principal adviser to the Secretary on all intermodal hazardous materials matters;
    - act as the focal point for review of hazardous materials policies, priorities, and objectives;

- provide oversight for planning and budgeting strategies for hazardous materials programs DOT-wide;
- resolve disputes among Operating Administrations on hazardous materials issues;
- provide external reviews and continual monitoring of DOT's hazardous materials programs; and
- coordinate DOT-wide hazardous materials outreach and data activities.

The new institutional capacity also should be tasked with addressing several regulatory and programmatic issues identified by the team during the program evaluation, but which were too complex or time consuming for this program evaluation. These issues are described later in this executive summary.

Program Delivery

The Department needs to refocus its efforts to improve its impact on hazardous materials safety. Shippers of hazardous materials and the traveling public should receive more attention by DOT to improve safety earlier in the transportation stream. We recommend that the Secretary take the following actions to improve program delivery:

- Develop strategies and actions to identify and focus more on high-risk or problem shippers through development of better data, more outreach activities, and inspections.

- Develop a method to improve the use of strike force inspections to cross-train inspectors as well as enforce regulations.

- Develop a coordinated, Departmentwide outreach program that is well-designed, visible, and directed toward the traveling public.

- Develop strategies and actions to increase the effectiveness of activities targeted at the human factor contribution to incidents. The institutional capacity should plan and ensure implementation of a coordinated plan of action, including outreach, inspections, and strengthening training standards to improve industry safety practices.

Sufficient and Reliable Data

The Department is hampered by the lack of reliable, timely, and accurate information with which to evaluate program effectiveness and base program

delivery decisions. As a result, the Department is unable to gauge its effectiveness or accurately assess its impact on achieving hazardous materials safety or better develop risk-based regulations. To improve the quality and quantity of hazardous materials data, the HMPE team recommends that the Secretary:

- Task the Bureau of Transportation Statistics, supported by the Operating Administrations, to review and analyze all existing databases containing hazardous materials information to make the data more useful in supporting a DOT-wide hazardous materials program. The project would also identify additional hazardous materials program data needs, including better information on incident causes, and establish and implement a plan to acquire the needed data.

- Require the modal Operating Administrations to identify in their budgets the funding and staffing levels being used to carry out their hazardous materials programs.

ADDITIONAL HAZARDOUS MATERIALS ISSUES TO BE RESOLVED

During the program evaluation, the team identified a number of issues that should be addressed by the Department, but which were too complex and time-consuming for this program evaluation. However, the HMPE team believes that DOT needs to resolve these issues for DOT to operate an effective, vigilant, and visible ONE-DOT hazardous materials program. The Department should task the new institutional capacity with addressing the following issues:

- Gain a better understanding of the nature of shipper and carrier practices related to undeclared hazardous materials shipments to determine whether additional Departmental efforts or resources are needed.

- Continue to clarify and improve the effectiveness of the hazardous materials regulations. During focus group meetings, several attendees commented on the difficulty for individuals or small businesses to use the regulations correctly.

- Review the adequacy of the Performance Oriented Packaging regulations. Comments made at the focus group meetings and the HMPE team's analysis of incident reports show a much higher percentage of incidents related to package failure than is currently identified by DOT.

- Continue to increase DOT’s cooperation with the United States Postal Service to identify any potential safety gaps as they relate to hazardous material shipments in the United States mail system.

- Continue DOT’s efforts to reauthorize its hazardous materials safety program, including expanding inspection authority to open packages suspected to be

non-compliant or containing hidden shipments of hazardous materials as has been proposed in the Hazardous Materials Reauthorization Act as well as in the ongoing rulemaking. Until DOT inspectors are aided by material changes in inspection and enforcement authority, the Department should identify ways to better use and improve upon its current inspection and enforcement strategies.

- Identify a measure for the performance plan that more fully reflects activities and outcomes over which the HMR have influence, rather than the current "serious incidents" measure. A proper performance measure would allow the Department to accurately assess the success of the hazardous materials program.

DOT's SENIOR LEADERSHIP RESPONSE

The program evaluation found that DOT's hazardous materials programs works reasonably well but needs to be improved through DOT-wide strategic planning and program coordination, more focused delivery, and better data.

To address the recommendations contained in the report, DOT's Deputy Secretary met with the HMPE Sponsors (the Assistant Secretary for Budget and Programs/Chief Financial Officer, the Inspector General, and the Administrator, Research and Special Programs Administration) and the HMPE team on December 14, 1999, to provide input and direction. The Deputy Secretary asked for two subsequent meetings with the HMPE Sponsors, the HMPE team, and DOT's Senior Leadership Team (comprised of DOT's Secretarial Officers and Heads of Operating Administrations) on January 13, and March 16, 2000. During February, the Heads of Operating Administrations with hazardous materials responsibilities and selected Secretarial Officers reviewed drafts of the report and provided the HMPE team with their technical and substantive comments which were incorporated in the report.

On January 13th, the HMPE team briefed the Senior Leadership Team on each of the recommendations contained in the report. At this meeting, the Deputy Secretary asked the HMPE team to meet with senior policy representatives from each of the affected Operating Administrations to develop an implementation strategy to establish the recommended institutional capacity to coordinate hazardous materials programs in the Department. The HMPE team and the policy representatives met on February 4 and 7, 2000, to discuss various organizational locations and structures for the institutional capacity.

On March 16th, the HMPE team met with the Senior Leadership Team to report on a proposal to implement an institutional capacity developed by the combined HMPE and policy team on February 4th and 7th. A unanimous decision was reached by the Senior Leadership Team to place this capacity in the Office of

Intermodalism under the Associate Deputy Secretary. It was also agreed during this meeting that DOT should begin drafting Secretarial delegations to place the additional necessary responsibilities and authorities under the Associate Deputy Secretary. On March 16th, the HMPE Sponsors tasked RSPA's Office of the Chief Counsel to work with the Department's Assistant General Counsel for Regulation and Enforcement to start drafting appropriate delegations. The draft delegations are expected to be completed shortly and coordinated within DOT.

Once the institutional capacity is in place and staffed, its first task will be to oversee implementation all of the recommendations in the report related to coordination, program delivery, and data and oversee the areas identified for further analysis. DOT's Senior Leadership Team also supported the recommendation that the Operating Administrations and the Bureau of Transportation Statistics work together to improve specific program delivery and data issues following issuance of the report.

CHAPTER 1

INTRODUCTION, BACKGROUND, OBJECTIVES, SCOPE, AND METHODOLOGY

Documenting DOT's hazardous materials program, as it was intended and as it actually functions, was a primary objective for the HMPE team. The law, regulations, and Secretarial delegations taken together describe the intended hazardous materials program. A description of the hazardous materials transportation law and applicable provisions is set forth in Appendix I. Secretarial delegations and regulations flowing from the authority established in the law are described in Appendix II.

INTRODUCTION

Department of Transportation (DOT) is responsible for ensuring the safety of the public from the inherent risks associated with transporting hazardous materials. DOT currently lists approximately 3,000 shipping descriptions for various hazardous materials such as poisons, chemicals, pesticides, radioactive materials, explosives, oil, and gasoline. These materials, if accidentally released, can pose risks to public health and safety, property, and the environment. For example, a train derailment in 1996 in Alberton, Montana, spilled several thousand gallons of chlorine, and resulted in 1 death, 787 hospitalizations, evacuation of over 1,000 people, and over $4.5 million in cleanup costs.

Annually, there are at least 300 million domestic shipments of hazardous materials in the United States.[1] Ninety-four percent of hazardous materials shipments are moved by truck; 5 percent by air; and less than 1 percent by rail, water, and pipeline.[2] (See Chapter 3 for a detailed description of shipments and movements.) Over 3.2 billion tons of hazardous materials are shipped annually in domestic commerce.

The majority of hazardous materials are transported safely in the United States. Although a large volume of hazardous materials moves in bulk either by water or by pipeline, most instances of hazardous materials releases occur in non-bulk movements by truck, rail, or air transport. The highway, air, and rail modes

[1] RSPA study on Hazardous Materials Shipments prepared by the Office of Hazardous Materials Safety, October 1998. The accuracy of these figures and all other numbers describing hazardous materials activities is uncertain. However, this is the only source of shipment and movement information available.

[2] The team uses shipments as the relative measure rather than tons or ton-miles because it is shipments that are proportional to handling, and risk of an incident increases during the act of loading or unloading.

accounted for approximately 84 percent, 9 percent, and 7 percent, respectively, of hazardous materials incidents in 1998. Water transport accounted for less than 1 percent of the incidents.

In 1998, 15,322 hazardous materials incidents were reported to the Department. RSPA considered 429 of these serious because the incident resulted in a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons for due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.[3] During 1998, there were 13 fatalities, 198 injuries (including 22 that required hospitalization), and $45 million in property damage reported to RSPA.

The probability of a serious hazardous materials incident occurring is low, but potential consequences can be catastrophic. The 1996 crash of Valujet Flight 592 into the Florida Everglades killing all 110 persons aboard is an example of a hazardous materials incident with catastrophic results. According to DOT's reports, 10 other deaths in 1996 resulted from hazardous materials transportation incidents.

Property damage figures maintained by DOT, however, understate the full cost of hazardous materials incidents. The costs associated with evacuations, closures of transportation arteries, emergency responses, or societal costs, such as lost lives; injuries; and delays to the traveling public, are usually not reported to RSPA. These costs could be substantial but are very difficult to determine. For example, on June 2, 1999, a flatbed tractor-trailer hauling black powder in an intermodal freight container overturned on Interstate-95 in Springfield, Virginia. Although the black powder packaging complied with Federal regulations, and no explosion or release of the hazardous material occurred, the incident closed the highway for 10 hours and, according to FHWA, affected an estimated 250,000 highway users. The FHWA estimated the value of time lost to the traveling public at $25 million.

BACKGROUND

Pre-Department of Transportation

As early as 1852, the Steamboat Inspection Service regulated the transportation of "dangerous articles," such as explosives and acids. In 1866, the first Federal law was passed to regulate the transportation of hazardous materials, specifically shipments of explosives and flammable materials such as nitroglycerin. An 1871 statute established criminal sanctions against persons who transported specific

[3] See Chapter 4 for more information on hazardous materials releases/incidents.

hazardous commodities on passenger vessels in United States navigable waters in violation of the Treasury Department regulations. In 1887, Congress gave the Interstate Commerce Commission (ICC) authority to regulate commercial transportation by the railroads.[4]

In 1908, Congress passed the Explosives and Other Dangerous Articles Act, which formed the basis for the laws governing hazardous material transportation for more than six decades[5]. It authorized the ICC to issue regulations covering the packing, marking, loading, and handling of explosives and other dangerous substances in transit and prescribed criminal penalties for shippers or carriers who violated ICC regulations. In addition, several states further regulated hazardous materials in commerce and formulated their own regulations which, in many cases, extended to interstate carriers passing through those states.

From 1908 to 1967, Congress expanded the ICC's regulatory authority over hazardous materials as rules originally designed for the railroads were applied to other modes of transport. The ICC developed its hazardous materials regulations through issuing orders and special permits.

Regulatory authority over highway transportation was given to the ICC in 1935 by the Motor Carrier Act.[6] The Coast Guard, under the Department of the Treasury, was required to adopt ICC regulations for classification of hazardous materials and for marking, labeling, and certifying portable containers by water in 1940 by the Transportation Act of 1940.[7] The Civil Aeronautics Board (CAB), in conjunction with safety officials of the Department of Commerce, developed the first regulations for transportation of hazardous materials by air carriers in the early 1940s.

Post-Department of Transportation

In 1966, Congress transferred the authority to regulate the transportation of hazardous materials from the ICC, the Department of the Treasury, and CAB to a new Federal agency, DOT. Within DOT, separate modal administrations were established and given responsibility for individually developing and enforcing hazardous materials transportation standards, and data collection and storage standards for their respective mode of transportation.

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[4] 24 Stat. 379, 1887.

[5] 35 Stat. 554, 1908.

[6] 49 Stat. 543, 1935.

[7] 54 Stat. 898, 1940.

Persistent administrative and organizational difficulties in the early 1970s led DOT to seek legislation to consolidate hazardous materials regulatory authority. However, little happened until a 1973 crash of a 707-cargo jet hauling several barrels of nitric acid. The National Transportation Safety Board accident investigation revealed a general lack of compliance with existing requirements, the overall complexity of the regulations, lack of industry familiarity at the working level with Federal regulations, and lack of sufficient government oversight.

In response to this incident, on January 3, 1975, the Hazardous Materials Transportation Act of 1974 (HMTA) was signed into law.[8] The HMTA authorized the Secretary of Transportation to draw together previously fragmented regulatory and enforcement authorities governing the movement of hazardous materials in commerce into one consolidated and coordinated body of law.

The Secretary of Transportation subsequently delegated regulatory responsibility for hazardous materials to the RSPA. Enforcement authority remained the responsibility of the United States Coast Guard (Coast Guard), the Federal Aviation Administration (FAA), the Federal Highway Administration (FHWA), the Federal Railroad Administration (FRA), and RSPA.

In 1990, Congress amended and strengthened the HMTA by enacting the Hazardous Materials Transportation Uniform Safety Act.[9] This law required DOT to issue safety regulations for the transportation of hazardous materials in foreign, interstate, and intrastate commerce. It also raised the maximum civil penalty for violations of any regulation issued under the HMTA from $10,000 to $25,000, and for the first time required a $250 minimum penalty for any violation. Currently, the maximum civil penalty is $27,500 as a result of the Federal Civil Penalties Inflation Act of 1990.[10]

The HMTA was codified in 1994 in Title 49 United States Code (49 U.S.C.) and is now referred to as the Federal hazardous material transportation law (HMTL).[11] Appropriate sections of the HMTL are in Appendix I. The HMTL is the current statute regulating hazardous materials transportation in the United States. While the HMTL provides the primary multi-modal authority for DOT's hazardous materials program, other relevant statutes are mode-specific.[12]

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[8] Public Law 93-633.

[9] Public Law 101-615.

[10] Title 28 U.S.C. § 2461, as amended by the Debt Collection Improvement Act of 1996 (Public Law 104-134).

[11] Title 49 U.S.C. § 5101 et seq.

[12] Among these are: 49 U.S.C. § 20101 et seq., formerly the Federal Railroad Safety Act of 1970; 49 U.S.C. § 40101 et seq., formerly the Federal Aviation Act of 1958; 49 U.S.C. § 31101 et seq., formerly the Motor Carrier Safety Act; and marine transportation laws, 33 U.S.C. § 1221 et seq. (the Ports and Waterways Safety Act) and 46 U.S.C. § 3701 et seq.

Effective October 9, 1999, the Secretary of Transportation rescinded the FHWA Administrator's authority to perform motor carrier safety functions and operations. The Secretary redelegated the authority to the Director of the Office of Motor Carrier Safety and then, on January 5, 2000, to the newly established Federal Motor Carrier Safety Administration (FMCSA).

Hazardous Materials Program Evaluation

The Government Performance and Results Act (GPRA) of 1993[13] required each agency to develop strategic plans that cover a period of at least 5 years and include the agency's: mission statement; long-term strategic goals; and a description of how the agency intends to achieve those goals and objectives. The plan should include a description of the operational processes, skills and technology, and the human, capital, information, and other resources required to meet the goals and objectives.[14] GPRA's purpose was to improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction. The Hazardous Materials Program Evaluation (HMPE) was established by the DOT Strategic Plan 1997-2002.

The DOT Strategic Plan sets forth the overall direction, vision, and mission of the Department through the year 2002 and focuses the Department's efforts on five strategic goals: Safety, Mobility, Economic Growth and Trade, Human and Natural Environment, and National Security. On March 9, 1999, the Secretary announced the formation of a ONE-DOT HMPE team to conduct a Departmentwide hazardous materials program evaluation. The Assistant Secretary for Budget and Programs/Chief Financial Officer, the Inspector General, and the Administrator of RSPA sponsored the program evaluation. RSPA and the Office of Inspector General (OIG) members co-chaired the HMPE team comprised of members from these offices as well as the Coast Guard, FAA, FHWA, and FRA.

The Department has one hazardous materials safety goal in the fiscal year 2000 Performance Plan. The goal is to reduce the number of serious hazardous materials incidents in transportation to 411 or fewer in 2000, from a peak of 464 in 1996.[15]

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[13] Public Law 103-62.

[14] Ibid.

[15] Over the past 5 years, the number of serious incidents involving hazardous materials reported to the Department has ranged from 358 in 1993 to 464 in 1996.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of the Departmentwide hazardous materials program evaluation were: (1) to document current hazardous materials movements, the Operating Administrations' programs, and their program delivery, and (2) to assess DOT's overall hazardous materials program as it affects each step in the hazardous materials transportation process, from packaging to receiver, and recommend appropriate improvements and areas for further study.

The HMPE team concentrated its efforts on nonbulk hazardous materials movements that cross modal boundaries because they usually involve a Departmentwide program and coincide with the intent for a DOT-wide review. Intermodal hazardous materials activities are covered by 49 Code of Federal Regulations (CFR) related to rulemaking and hazardous materials program procedures. Specifically, the Hazardous Materials Regulations (HMR), 49 CFR Parts 171-180 govern the packaging and safe transportation of hazardous materials by air, highway, rail, and water. The program evaluation did not include bulk shipments by water (involving only the Coast Guard) and pipeline shipments (involving only RSPA), because they are not covered by the HMR but are covered by 33 CFR Parts 125-199; 46 CFR Parts 1-199; and 49 CFR Parts 181-199. Also, the program evaluation did not focus on program issues relating solely to an individual Operating Administration's hazardous materials program.

The HMPE team used data from 1990 to 1998 to identify trends. To determine current conditions, the HMPE team used 1998 data to the maximum extent possible. However, when 1998 data were unavailable, the HMPE team used the most recent official data. October 21, 1999 is the latest data used by the HMPE team from RSPA's various databases.

The HMPE team reviewed hazardous materials legislation and regulations; analyzed mission and function statements; reviewed prior internal and external reports; and interviewed hazardous materials managers and field personnel. In addition, the HMPE team analyzed written responses to questions published in Federal Register Notice, FR Doc. 99-17175 (see Appendix III) and the results of three focus group meetings; reviewed the Department's and Operating Administrations' Strategic and Performance plans; analyzed work plans, budgets, resources, and incident data; and participated in field inspections and enforcement activities.

The HMPE team conducted an analysis of the Strategic and Performance Plans developed by the Operating Administrations to identify hazardous materials goals and performance measures and reconciled them with the Department's Strategic and Performance Plans. The HMPE team participated in the various Operating

Administrations' inspection activities. Observations made during these activities were used to develop issues and identify the strengths and weaknesses of the Department's hazardous materials programs.

The HMPE team attended the Cooperative Hazardous Materials Enforcement Development conference in Salt Lake City to get a better understanding of state and local enforcement personnel, first responders, and industry's views concerning DOT's hazardous materials program. The Department's senior hazardous materials managers from each Operating Administration were interviewed to provide a fuller understanding of their program's operations and to identify program strengths and weaknesses. The team also evaluated Operating Administration databases used to record inspection results and hazardous materials incidents.

The HMPE team briefed DOT's senior leadership in January 2000 on the team's findings and recommendations, and in March 2000 on strategies for implementing the recommendation to establish an institutional capacity for overseeing a Departmentwide hazardous materials program. The implementation strategies were developed by the HMPE team working with senior policy officials from the Department in meetings lasting one and one-half days. During February 2000, the Operating Administrations with hazardous materials responsibilities and selected Secretarial Officers reviewed drafts of the report together with the executive summary and provided the HMPE team with their technical and substantive comments which were incorporated in the final report. In addition, on February 4 and 7, 2000, the HMPE team and the senior policy representatives from the Operating Administrations and selected Secretarial offices met at the direction of the Deputy Secretary to discuss various organizational locations and structures for the institutional capacity. (See Appendix IV for a complete description of the methodology used in the program evaluation.)

CHAPTER 2

HAZARDOUS MATERIALS LAW AND SECRETARIAL DELEGATIONS

Documenting DOT's hazardous materials program, as it was intended and as it exists, was a primary objective for the HMPE team. This chapter discusses the laws and Secretarial delegations that form the DOT hazardous materials program.

Federal Hazardous Materials Transportation Law

The stated purpose of the HMTL is to provide adequate protection against risks to life and property inherent in the transportation of hazardous materials in commerce. The intent of the HMTL is to improve the Secretary of Transportation's regulatory and enforcement authority. When the Secretary decides that transporting a group or class of material in a particular amount and form could pose an unreasonable risk to health, safety, or property, then that material, group, or class of materials is designated as hazardous.

The HMTL applies to a person or entity transporting hazardous materials in commerce or causing hazardous materials to be transported in commerce. The HMTL also applies to the manufacturing, fabricating, marking, maintaining, reconditioning, repairing, or testing of a packaging or container that is represented, marked, certified, or sold as qualified for use in the commercial transport of hazardous materials.

The HMTL requires DOT to maintain a central reporting system and to provide information for emergency response to hazardous materials transportation incidents.[16] To carry out this mandate, RSPA maintains the Hazardous Materials Information System (HMIS), which includes data reported by carriers over the past 30 years. HMIS data are used by Federal, state and local officials, private emergency response organizations, and others. In addition, the Coast Guard maintains, with the support of RSPA, an around-the-clock National Response Center. Also, approximately every 3 years, RSPA publishes and distributes to the emergency response community an Emergency Response Guidebook.

[16] Title 49 U.S.C. § 5121.

Delegations by the Secretary of Transportation

The Secretary of Transportation has delegated hazardous materials responsibilities to the Operating Administrations. Regulatory responsibility for hazardous materials was delegated primarily to RSPA, while enforcement authority was delegated to the Coast Guard, FAA, FHWA,[17] FRA, and RSPA. The provisions governing each mode of transportation and the authority and responsibility for DOT's Operating Administrations are summarized in Appendix II.

Under the HMTL, RSPA is solely responsible for: issuing rules and regulations governing the safe transportation of hazardous materials (except for highway routing); issuing, renewing, modifying, and terminating exemptions and approvals; and making administrative determinations[18] of whether state, local, or Indian tribe requirements (1) are preempted by the HMTL or (2) may remain in effect under a waiver of preemption. In addition, RSPA has the authority to require registration and payment of fees by certain shippers and carriers.

RSPA has primary enforcement jurisdiction over container manufacturers (except modal-specific bulk packaging), reconditioners, and retesters, and a shared authority with the other Operating Administrations over shippers of hazardous materials, exemption holders, and persons required to register as hazardous materials shippers. RSPA also represents DOT in international organizations working to assure the compatibility of domestic regulations with the regulations of bodies such as the International Maritime Organization, the International Civil Aviation Organization, the United Nations Economic Commission for Europe and Economic and Social Council, and the International Atomic Energy Agency.

FAA is delegated inspection and enforcement authority with respect to hazardous materials transportation by air and bulk packagings used in air transport. FAA also has the authority to enforce the Federal Aviation Act provisions as they relate to the transportation of such materials by air, and authority to devise and carry out procedures for monitoring and enforcing provisions of regulations with respect to the transportation of radioactive materials on passenger-carrying aircraft.

The Coast Guard is delegated inspection and enforcement authority with respect to all regulations applicable to vessel carriers and shippers by water and for bulk packages used for marine transport. Under laws in addition to the HMTL, the

[17] On January 9, 1999, FHWA's authority to perform motor carrier safety functions and operations was redelegated to the Director of the Office of Motor Carrier Safety, then, on January 5, 2000, to the Federal Motor Carrier Safety Administration (FMCSA).

[18] Except for highway routing determinations and waivers of preemption issued by FMCSA.

Coast Guard issues regulations for hazardous materials being transported in bulk by vessel.

FRA has inspection and enforcement authority with respect to all regulations applicable to rail carriers, shippers by rail, and manufacturers of tank cars. Under authority independent of the HMTL, FRA may issue orders to deal with dangers caused by the transportation of hazardous materials over unsafe track or by unsafe rail carriers.

FMCSA has inspection and enforcement authority with respect to all regulations applicable to motor carriers, shippers by highway, and manufacturers of cargo tanks. As authorized by the HMTL, FMCSA has the authority to issue regulations for highway routing of hazardous materials and highway safety permits for hazardous materials transportation, and preemption determinations and waivers of preemption concerning highway routing requirements.

More specific regulatory functions for each Operating Administration are set forth in Appendix II.

CHAPTER 3

HAZARDOUS MATERIALS SHIPMENTS, MOVEMENTS AND GROWTH FORECAST

This chapter provides an overview of domestic hazardous materials shipments and movements, the extent of the hazardous materials industry, and the trends in hazardous materials incidents. No central data system exists in the Department to support the hazardous materials program. Therefore, the HMPE team used outside information and databases maintained by the individual Operating Administrations that were designed to support larger safety programs. The data presented here are imperfect, but they represent the best data available. Data deficiencies are discussed in Chapter 7 and Appendix V.

Hazardous Materials Shipments and Movements

A RSPA study estimated that there are 800,000 domestic shipments and 1.2 million movements of hazardous materials in the United States each day, and that 3.2 billion tons are shipped and 3.9 billion tons are moved each year.[19] A s*hipment*, as defined by RSPA, is equivalent to a delivery to a final destination, and may involve several movements. A *movement*, on the other hand represents each intermediate transfer of the hazardous material as it moves through the transportation stream.

Delivering a shipment of hazardous materials to its final destination often involves multiple handling and reshipments, depending on the product and the mode(s) of transport. Some shipments, for example, small packages in air cargo, usually require at least three movements: movement from the manufacturer by truck to the airline; movement by the airline; and movement by truck from the airline to the end user. Figure 1 depicts a single air shipment that required six movements to reach its final destination.

[19] RSPA study prepared by the Office of Hazardous Materials Safety on Hazardous Materials Shipments, October 1998.

Figure 1
Depiction of Air Shipment Requiring Multiple Movements

Table 1 shows the estimated number of shipments, movements, and tons moved by mode of transportation for 1996. These figures present the best available data, but are estimates (see Appendix V for discussion of data limitations). For estimates of the number of movements in highway, air, rail, and water sectors, RSPA assumed movement factors of 1.5, 2.0, 3.0, and 2.0 times the respective number of shipments. For example, in the rail sector, a factor of 3.0 was used to reflect the frequency with which rail cars may be reconfigured within a train or switched from one train to another, usually after passing through a rail switching yard.

Table 1
Domestic Bulk and Packaged Shipments and Movements by Mode of Transportation

Mode	Daily Shipments	Percent of Total	Daily Movements	Percent of Total	Daily Tons Moved	Percent of Tons Moved
Highway	768,907	94	1,154,450	92	3,794,970	50.69
Air	43,750	5	87,500	7	8,098	0.11
Rail	4,315	<1	12,945	1	1,136,748	15.19
Water	335	<1	670	<1	2,545,850	34.01
Total	**817,307**		**1,245,565**		**7,485,666**	

Source: RSPA Hazardous Materials Shipments, October 1998. Table does not include pipeline data, which account for less than 1 percent of total daily shipments and movements (although a greater share of tons and ton-miles), because pipeline movements were not included in the program evaluation. Mode-to-mode comparisons of shipments and movements are not appropriate. For example; Table 1 reports highway shipments and water shipments equally, but a single vessel may contain upwards of 3,000 forty-foot truckloads.

Manufacturer, Shipper, and Carrier Populations

According to US Department of Commerce 1993 Commodity Flow Survey data, there were 14,537 establishments engaged in the manufacture of hazardous materials.[20] Using information contained in the 1997 Commodity Flow Survey, RSPA estimated that approximately 47,000 firms are shipping significant quantities of hazardous materials. This figure, however, does not include small or occasional shippers. DOT officials have used the figure of 75,000 to represent the universe of hazardous materials shippers in the United States. However, this figure may be understated because many "firms" or shippers have multiple business locations.

Similarly, the number of carriers handling hazardous materials is also unknown because not all Operating Administrations have a systematic process for updating their files.[21] Information in existing DOT databases, such as FMCSA's[22] Motor Carrier Management Information System database and U.S. Army Corps of Engineers Waterborne Transportation data, contained approximately 500,000 potential carriers of hazardous materials. About 43,000 *carriers* are dedicated hazardous materials transporters that primarily move petroleum products and corrosives in cargo tank trucks. Yet, *every* carrier known to the Department can knowingly, or even unknowingly, carry hazardous materials. Table 2 shows the number of hazardous materials carriers contained in the Operating

[20] Source: US Department of Commerce 1993 Commodity Flow Survey data. The survey is conducted every 5 years and samples establishments, not shippers or carriers, and produces national estimates.

[21] The HMR defines carriers as a person (company) that operates one or more transport vehicles.

[22] On October 9, 1999, FHWA's authority to perform motor carrier safety functions and operations was redelegated to the Director of the Office of Motor Carrier Safety and then, on January 5, 2000, to the FMCSA.

Administrations' databases, *which potentially could carry hazardous materials*. A complete description of the DOT databases on hazardous materials information is provided in Appendix V.

Table 2
Number of Potential
Hazardous Materials Carriers

Mode	Number of Carriers
Air*	3,500
Highway	497,908
Rail	559
Marine	1,300
Total	**503,267**

***** Includes both domestic and foreign carriers with the potential to carry hazardous materials.
Sources: FAA Air Carrier data; FMCSA National Carrier Census Summary Report; FRA Inspection Database; and U.S. Army Corps of Engineers Waterborne Transportation Lines of the United States, Calendar Year 1997, Volume 1, National Summary.

Vehicle, Vessel, and Aircraft Populations

Approximately 444,000 vehicles and vessels are dedicated to hazardous materials transport, primarily highway tank trucks and railroad tank cars. Potentially, another 7.6 million vehicles, vessels, and aircraft could carry hazardous materials on a periodic basis. When one considers the potential for hazardous materials to be undeclared, either due to economics or lack of knowledge, any vehicle, vessel, or aircraft could carry hazardous materials. The fleet breakdown by mode is shown in Table 3.

Table 3
Hazardous Materials Fleet/Vehicles

Mode	Dedicated HM Fleet/Vehicles	Additional Potential HM Fleet	Total Potential Fleet
Truck	195,000	6,436,000	6,631,000
Rail	238,000	1,078,000	1,316,000
Waterborne[1]	11,000	68,000	79,000
Air (commercial aircraft)[2,3]	0	12,000	12,000
Total	**444,000**	**7,594,000**	**8,038,000**

[1] Represents both United States and foreign flag vessels including barges.
[2] The figures are based on the air fleet of carriers who "will carry" hazardous materials.
[3] Aircraft are not typically dedicated to hazardous materials transport.

Information on the numbers of hazardous materials manufacturers, shippers, carriers, and transport fleet of vehicles is indicative of the potential size and scope of the hazardous materials industry that DOT is responsible for regulating.

Forecasts of Growth in Hazardous Materials Movements

A forecast by the Chemical Manufacturers Association (CMA)[23] projects that tons of chemicals produced will grow by 2 percent annually. We applied the projected annual growth rate of 2 percent to the baseline RSPA estimate of 3.2 billion tons of all hazardous materials shipped in 1996, *including both chemicals and petroleum products*. This resulted in a forecast of 5.1 billion tons of hazardous materials being shipped by the year 2020, about 59 percent higher than today. A forecast prepared by DRI/McGraw Hill estimated growth of roughly 2.5 percent per year through 2003. The second forecast also estimated that air and intermodal growth would be 4 times and 3 times faster, respectively, than overall growth in hazardous materials shipments.

[23] In May 1999, CMA provided a growth forecast to the RSPA Associate Administrator for Hazardous Materials.

CHAPTER 4

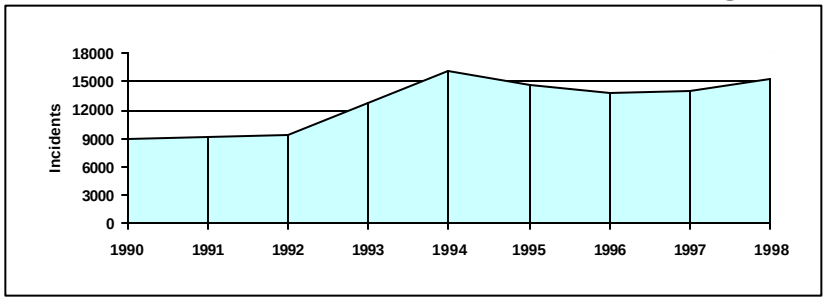
HAZARDOUS MATERIALS INCIDENTS

This chapter provides information on the number, location, cause, and trends in hazardous materials incidents. The chapter also provides the modal distribution of incidents and a discussion of serious hazardous materials incidents.

A *hazardous material incident* is an unintentional release of hazardous material from a package during the course of transportation, including loading, unloading, and temporary storage. All incidents are required to be reported to RSPA within 30 days. Additionally, certain incidents require immediate notification to the Department's National Response Center if, as a direct result of the hazardous material, there is a death, an evacuation of the public lasting one or more hours, or the altering of the operational flight pattern of an aircraft.[24]

Approximately 97 percent of hazardous materials incidents are minor and do not have serious consequences. A typical hazardous materials incident might be a fiberboard package leaking flammable liquids that is discovered during the loading or unloading of a truck where no one is injured. From 1990 through 1998, nearly 115,000 hazardous materials incidents, an average of roughly 12,700 per year, were reported to RSPA.[25] In 1998, there were 15,322 incidents, 70 percent more than reported in 1990. Most of the increase occurred between 1992 and 1994. RSPA attributes the majority of that increase to more stringent reporting requirements and closer oversight of the hazardous materials community to ensure that incidents are reported. Figure 2 shows the number of reported hazardous materials incidents from 1990 through 1998.

Figure 2
Hazardous Materials Incidents From CY 1990 Through CY 1998



Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident database as of October 21, 1999.

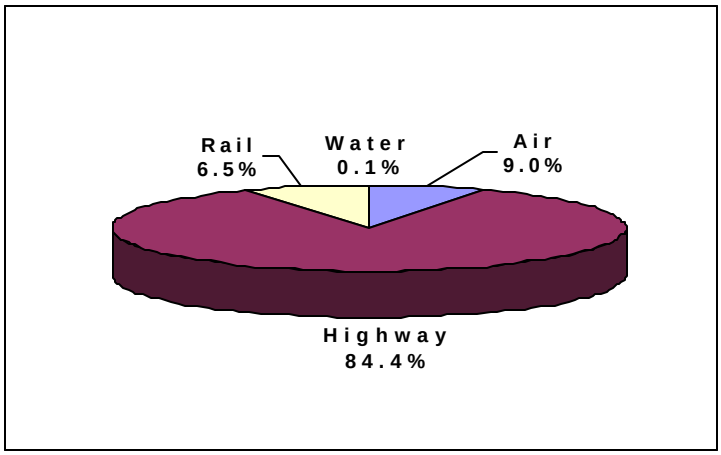
[24] 49 CFR Subpart 171.15.

[25] Figures obtained from RSPA HMIS database as of October 21, 1999. The accuracy and completeness of the data have been questioned by an internal RSPA study, several GAO reports, and by the 1986 Office of Technology Assessment study of the Hazardous Materials program. (See Chapter 7 and Appendix V for further discussion of data limitations.) Incident data represents interstate shipments only; intrastate incidents were required to be reported beginning October 1, 1999.

However, as discussed more fully in Chapter 7 of this report, the HMPE team found there are serious questions concerning the accuracy and completeness of incident data reported to RSPA and contained in the HMIS. This affects the Department's ability to identify trends, evaluate the impact of the hazardous materials program on safety, and determine incident causes.

Figure 3 depicts the distribution of incidents in 1998 by mode of transportation. About 84.4 percent of the reported incidents occurred, or were reported, while the hazardous material was in the possession of highway carriers, 9 percent by air carriers, 6.5 percent by rail carriers, and 0.1 percent by water carriers.

Figure 3
Distribution of All 1998 Hazardous Materials Incidents by Mode



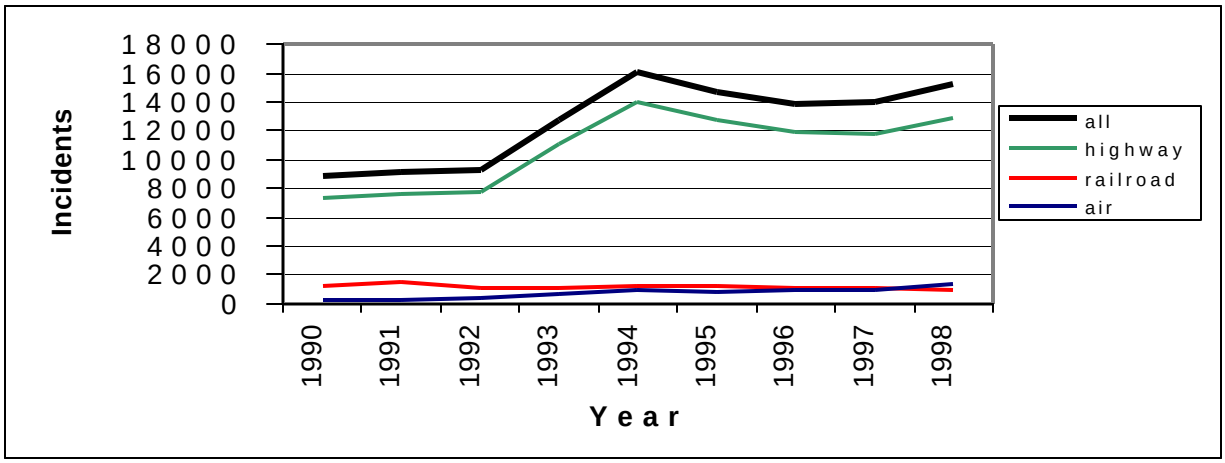
Source: RSPA HMIS incident database as of October 21, 1999.

RSPA data also show that 43 percent of hazardous materials incidents occurred in industrial areas, 49 percent in commercial areas, 2 percent in residential areas, and 1 percent in agricultural areas. By type of community, 44 percent occurred in urban areas, 37 percent in suburban areas and 14 percent in rural areas. Furthermore, RSPA data showed that 55 percent of the incidents were found during unloading, 19 percent during loading, 18 percent enroute (nonaccident), 2 percent enroute (involving vehicular accidents or derailments), and 6 percent within a terminal or storage site. RSPA personnel stated that although the majority of incidents are discovered and reported as having occurred during unloading, they could have occurred in transit or during loading. Therefore, this data may not accurately indicate the location in the transportation stream where incidents are actually occurring.

Trend lines showing total hazardous materials incidents and the air, highway, and railroad modes' contributions to the total number of hazardous materials incidents over the past decade are depicted in Figure 4. The water mode averaged less than

10 reported incidents per year and, thus, could not be reflected on the chart. The lack of water-borne incidents is a result of a number of factors such as carriers are not required to file incident reports unless the incident occurs while the vessel is in the navigable waters of the United States; or, spills are reported to the Coast Guard in accordance with the requirements of the Clean Water Act rather than the HMTL. As mentioned previously, RSPA attributes the increase of incidents from 1992 through 1994 to improved carrier awareness of reporting requirements and closer oversight of the hazardous materials community to ensure that incidents are reported.

Figure 4
Hazardous Materials Incidents by Mode, From 1990 Through 1998



Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident database as of October 21, 1999.

Serious Incidents

In 1998, 429 incidents were categorized as serious, roughly 3 percent of all incidents that year. RSPA defines serious incidents as those incidents that involve: a fatality or major injury due to a hazardous material; closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material; or a vehicle accident or derailment resulting in the release of a hazardous material.[26] The Department has established as a goal in its Performance Plan for fiscal year 2000, to reduce the number of serious incidents to 411 or fewer.

From 1990 through 1998, RSPA received reports on 3,685 serious incidents, which resulted in 211 deaths and 4,664 injuries. Reported property damage was

[26] To meet the definition of serious, the persons evacuated are to be part of "the general public" and not transportation employees.

roughly $329 million. Table 4 shows the annual number of hazardous materials incidents, serious incidents, fatalities, injuries, persons evacuated, and property damage from 1990 through 1998.

Table 4
Serious Hazardous Material Incident History From 1990 Through 1998

Year	Total Reported Incidents	Number of Serious Incidents	Number of Fatalities	Number of Injuries	Number of Persons Evacuated	Amount of Property Damage
1990	8,879	**402**	8	423	12,123	$32,353,276
1991	9,110	**403**	10	439	10,502	$38,350,611
1992	9,310	**375**	15	600	29,186	$35,164,057
1993	12,830	**357**	15	627	18,237	$22,801,551
1994	16,087	**429**	11	577	18,398	$44,185,413
1995	14,743	**409**	7	400	11,444	$30,903,281
1996	13,950	**464**	120[1]	1,175[2]	19,556	$46,849,243
1997	13,994	**417**	12	225	24,587	$33,393,504
1998	15,322	**429**	13	198	9,181	$45,497,550
Total	**114,225**	**3,685**	**211**	**4,664**[3]	**153,214**	**$329,498,486**

Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident database as of October 21, 1999.

[1] 110 deaths were the result of the ValuJet incident in 1996.

[2] A single rail incident in Montana involving chlorine resulted in injuries to 787 people.

[3] In summarizing serious incident injuries for the biennial report, RSPA combines hospitalization (serious) injuries with minor injuries.

The HMPE team believes HMIS's property damage data is misleading because it seriously understates total economic losses. Information on costs associated with product losses, carrier damage, property damage, and decontamination/cleanup costs are included on DOT Form 5800.1, which is to be completed after each incident (see Appendix VI). However, costs associated with evacuations, closures of transportation arteries, and emergency responses are rarely reported. For example, the flatbed tractor-trailer hauling black powder in an intermodal freight container that overturned on Interstate-95 in Springfield, Virginia on June 2, 1999, did not explode or release any black powder. Yet FHWA estimated this single incident, which blocked traffic for 10 hours, cost $25 million in terms of traffic delays.[27] The carrier, however, reported damages of only $120,000.

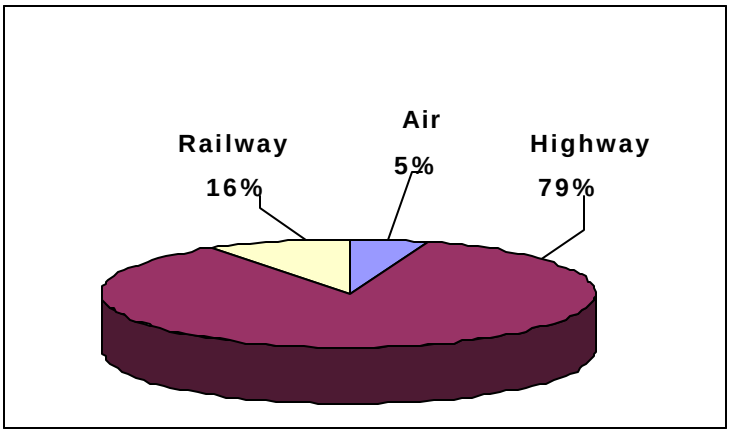
Further supporting the view that losses are understated is a contractor study commissioned by the FHWA which examined accidents and incidents that occurred in 1996 involving flammable liquids transported by motor vehicles. The study estimated that the economic losses associated with 3,766 accidents and incidents totaled $482 million. The economic losses included in the FHWA study

[27] On January 9, 1999, FHWA's authority to perform motor carrier safety functions and operations was redelegated to the Director of the Office of Motor Carrier Safety and then, on January 5, 2000, to the FMCSA.

differ from the HMIS database, primarily because the study places a dollar value on injuries ($200,000 each), fatalities ($2 million each), and traffic delays ($15 per person per hour). The study also included *intrastate* accidents and incidents, whereas the HMIS was then limited to *interstate* incidents. Beginning in FY 1999, intrastate highway motor carriers were required to report incidents involving hazardous materials. RSPA has not yet analyzed the FY 1999 HMIS information to distinguish intrastate from interstate incidents.

RSPA incident data contained in the HMIS also showed that highways accounted for 79 percent of serious incidents for 1998. Figure 5 depicts the distribution of 1998 serious incidents by transportation mode.

Figure 5
Serious Incidents by Mode for 1998



Source: RSPA HMIS incident database as of October 21, 1999.

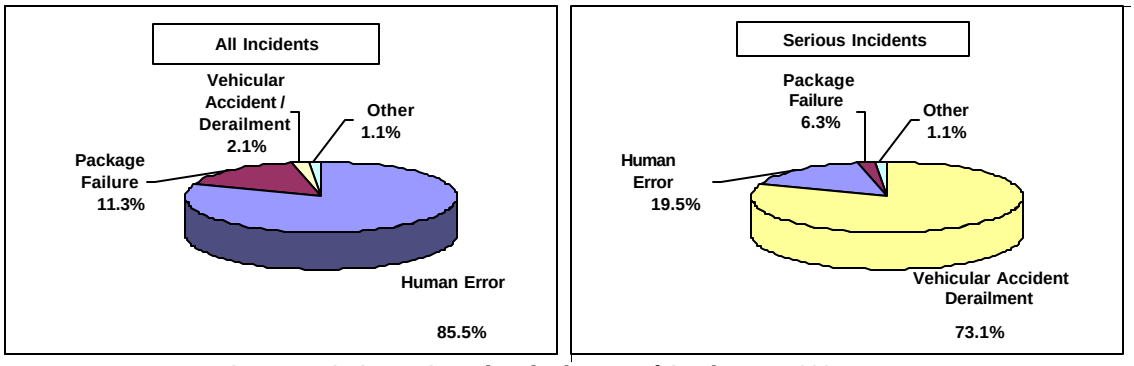
The distribution of serious incidents by mode differs significantly from the distribution of incidents overall. Rail accounts for only 6.5 percent of all incidents (depicted in Figure 3), but 16 percent of serious incidents (Figure 5). Due to the large bulk quantities and the class of hazardous materials carried by railroads, a rail incident is often more serious.

RSPA 1998 data show that gasoline is the commodity most frequently involved in serious incidents, comprising 15 percent of all serious incidents. Overall, various types of flammable liquids and corrosive materials account for 57 percent of serious incidents.

Causes of Incidents

According to RSPA data, human error is the largest contributing factor to hazardous materials incidents. Over the past 5 years, 80 to 85 percent of hazardous materials incidents were attributed to human error. As we will point out, our analysis suggests this statistic may be unreliable based upon deficiencies in RSPA's causal classification process. Data for 1998 show that human error caused 85.5 percent of hazardous materials incidents, package failure 11.3 percent, and vehicular accident/derailment 2.1 percent. The percentages are significantly different for serious incidents. Roughly 73 percent of serious hazardous materials incidents are attributed to a vehicle accident or derailment while human error is identified as the cause in approximately 19 percent of serious hazardous materials incidents. (See Figure 6.)

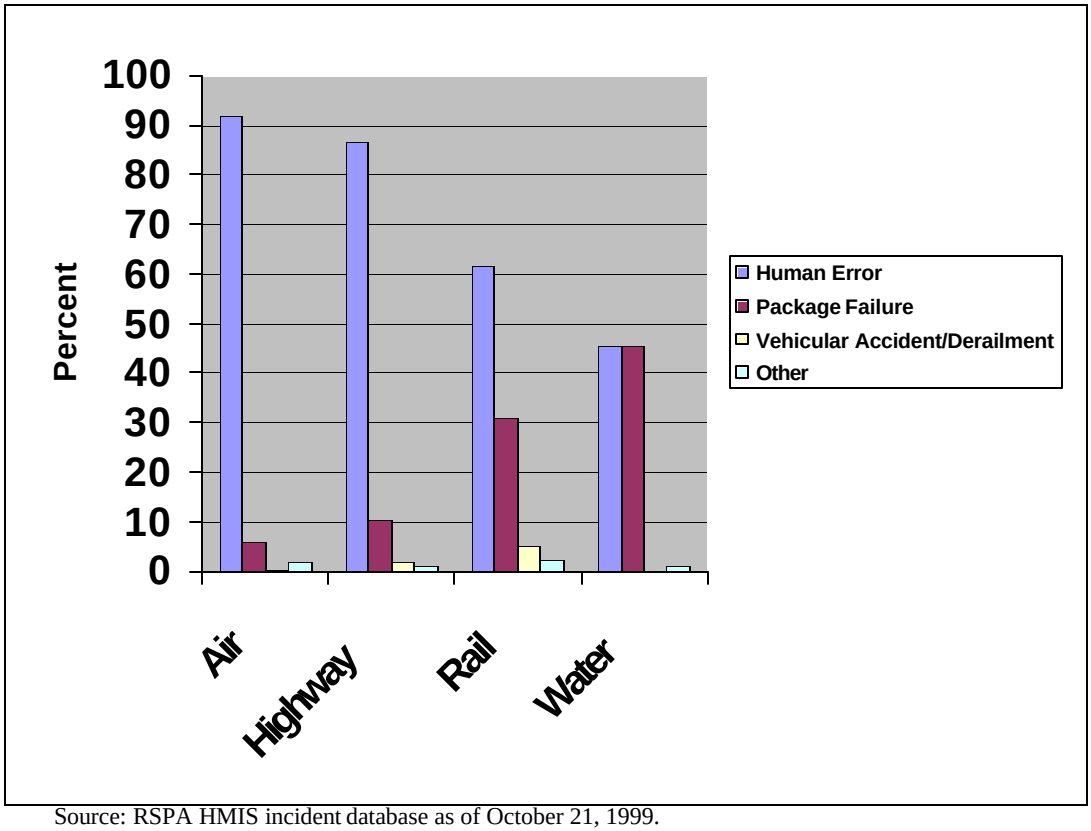
Figure 6
Hazardous Materials Incident Causes – 1998
All Incidents Versus Serious Incidents



Source: RSPA HMIS incident database as of October 21, 1999.

Figure 7 shows the modal breakdown by cause for all 1998 hazardous materials incidents, using the most complete data available. Except for the water mode, which has very few reported incidents, the vast majority of incidents were attributed to human error.

Figure 7
Incident Cause by Mode – 1998



Source: RSPA HMIS incident database as of October 21, 1999.

As discussed throughout the report, the accuracy of the incident cause data is uncertain. The Form 5800.1, used to report incident information to RSPA, does not directly document causality. Instead, RSPA contract personnel who review the form, especially the narrative description of the incident, determine the probable cause. If a cause cannot be determined from the available information, *the contract employees categorize the cause as human error*. The accuracy of the data compiled by the contractor personnel is limited by the quality of the narrative portion of the Form 5800.1 and the experience of the contractor personnel. The contractor personnel, according to RSPA, have no field experience as hazardous materials inspectors or work experience in the hazardous materials industry. Additionally, only 25 percent of contractor personnel have undergone some form of hazardous materials classroom training.

The HMPE team believes this could result in incidents being incorrectly categorized. For example, an incident report narrative noting that an employee dropped a box and released hazardous materials would be categorized, without additional information, as human error. However, if the box was dropped within the performance standard height for that particular package and there was a

release, the cause of the incident might more appropriately be categorized as a package failure.

To evaluate the accuracy of RSPA's classification procedures, the HMPE team analyzed all 13,950 incident reports for 1996. Our conclusions are markedly different from RSPA's. For example, RSPA reported that package failure was the cause of 15.4 percent of all incidents versus our determination of 34.6 percent. The five HMPE team members who reviewed these incidents all have inspection backgrounds. Their collective knowledge is based on more than 80 years experience performing inspections of hazardous materials carriers and they are trained to look at incidents from a root cause standpoint. Table 5 compares RSPA's data with the HMPE team's analysis.

Table 5
Distribution of Incident Causes

Cause	RSPA Determined Cause (percent of total)	Program Evaluation Team Determined Cause (percent of total)
Human Error	80.7	61.0
Package Failure	15.4	34.6
Vehicle Accident/Derailment	2.4	2.6
Other	1.5	1.8
Total	**100**	**100**

Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident remarks subsystem report for 1996.

Our analysis suggests that the lack of program knowledge by contractor personnel is compounded by the data limitations presented in the Form 5800.1. RSPA has a current rulemaking to revise the form that could improve the quality of reported data, but it does not have plans for giving the contract employees training.

CHAPTER 5

PROGRAM DELIVERY

This chapter describes the intervention methods and activities the Department uses to deliver the hazardous materials program to the hazardous materials community.[28] The HMPE team uses the term hazardous materials "program delivery" to designate the entire range of activities undertaken by the Operating Administrations to increase safety. These program delivery activities include DOT actions regarding regulations, inspections, assessments, compliance reviews, investigations, enforcement actions, civil penalties, training, and outreach.

Hazardous Materials Program Organization and Resources

At the headquarters and field levels, the Operating Administrations' hazardous materials programs are organizationally similar but differ in the level and type (Federal and/or state) of resources supporting these programs.[29] Each of the Operating Administrations engages in inspections and reviews, enforcement, civil penalty processing, and outreach activities. Each has a field structure, primarily devoted to compliance efforts, which is supported by headquarters staff.

FAA has 70 inspectors located at 28 international gateway airports, supported by 25 specialists in 10 regional offices. These inspectors and specialists are supported by 12 attorneys and 6 headquarters staff. The Coast Guard has 51 container inspectors, billeted in 26 coastal ports, supported by a 9-person training and assistance team, and a headquarters staff of 6 program managers and 1 attorney. FRA has 47 inspectors in the field, directed by a field specialist in each of 8 regional offices, which are directed by a headquarters staff of 7 program managers and supported by 1 attorney.

While FMCSA[30] has by far the largest segment to regulate, the motor carrier industry, it has the fewest field inspectors. Its 13 hazardous materials specialists provide support to the state programs, and they are in turn supported by 10 divisional hazardous materials program managers. At the headquarters level, there are three FMCSA program managers and one attorney. RSPA's hazardous materials program includes 119 individuals, including 32 inspectors, 28 of which

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[28] The HMPE team uses the term "intervention" to include: any assessment, inspection, enforcement, review, investigation, or outreach activity aimed at assessing or improving hazardous materials community compliance with the hazardous materials regulations.

[29] Organizational charts illustrating placement of the hazardous materials programs within each Operating Administration are set forth in Appendix VII.

[30] On October 9, 1999, FHWA's authority to perform motor carrier safety functions and operations was redelegated to the Director of the Office of Motor Carrier Safety and then, on January 5, 2000, to the FMCSA.

are field specialists located in 5 regional offices, with 4 field investigators, 2 enforcement program managers, and 1 administrative support staff located at headquarters. RSPA's headquarters Office of Hazardous Materials Safety employs 82 personnel who provide program support in five other broad categories: (1) standards development, (2) science and engineering support, (3) exemptions and approvals, (4) initiatives and training, and (5) planning and analysis. Five attorneys support RSPA's hazardous materials program.

The similarities among DOT's Operating Administrations begin to fade with the use of state inspectors. The FRA arranged for 22 state employees to conduct inspections, enforcement, and outreach functions in concert with FRA's Federal program. No Federal funding is provided by FRA to the participating states to conduct inspections; however, FRA does provide funds for training. The Office of Motor Carrier Safety, now part of FMCSA, has the most unique organization of the five Operating Administrations involved in hazardous materials regulation enforcement. Its approach has been to provide Federal funding to states through the Motor Carrier Safety Assistance Grant Program.[31] The result has been approximately 2,100 federally funded state (including the District of Columbia and Puerto Rico) employees conducting roughly 2.1 million roadside inspections of motor carriers, including approximately 130,000 inspections of hazardous materials carriers annually.

As discussed more fully in Chapter 6, shippers of hazardous materials generally receive less attention Departmentwide than carriers, yet they offer the greatest opportunity to improve safety. The Coast Guard, FRA, and FMCSA focus primarily on carriers while FAA's work plan shows an equal emphasis on carriers and shippers. RSPA uses its 28 inspectors in its hazardous materials program to concentrate on shippers, package manufacturers, retesters, reconditioners, and repair facilities

Collectively, DOT's hazardous materials program employed the equivalent of 252 field personnel, 117 headquarters employees, and 19 attorneys who managed and delivered a hazardous materials program DOT-wide in 1998. They performed approximately 126,000 inspections and enforcement actions at an estimated cost of about $37 million. This represented roughly 1.6 percent of DOT's 1998 safety program funding.

[31] The Motor Carrier Safety Assistance Grant Program is a FMCSA program to assist states in implementing of vehicle safety and hazardous materials compliance and enforcement.

Rulemaking

The Secretary of Transportation delegated regulatory authority for the transportation of hazardous materials under the HMTL to the RSPA Administrator. The Office of Hazardous Materials Standards within RSPA is responsible for producing and maintaining national safety standards for hazardous materials for all modes of transportation and is typically responsible for 30 or more rulemakings in any given year. Under the umbrella of RSPA-promulgated hazardous material regulations, the Operating Administrations operate *mode-specific* hazardous materials programs.

The Hazardous Materials Regulations (HMR) contribute to transportation safety by setting two broad requirements, containment and hazard communication. First, the HMR establishes a packaging system to ensure that hazardous materials are placed in packages that are compatible with the material and strong enough to withstand the rigors of transportation without leaking. Second, the HMR creates a communication system to ensure that the hazards associated with the commodity are clearly communicated to employees on the loading dock, emergency responders, and anyone else who might handle the shipment. In short, the HMR strives to prevent hazardous materials from leaking out of their packages, and to communicate the presence of the specific hazards on packages, shipping documents, and transportation vehicles or vessels.

The rulemaking activities RSPA undertakes are coordinated with the affected modal administrations. For example, the FRA drafts the applicable railroad hazardous materials regulations and processes them through RSPA for promulgation. The Coast Guard ensures the correctness and consistency of the rules with the other maritime portions of the Federal regulations and with the most recent amendments to the International Maritime Dangerous Goods Code. FMCSA, with RSPA assistance, drafts regulations related to specifications for cargo tanks and processes them through RSPA for promulgation, while FAA generally limits its involvement to coordination with RSPA on aviation-related rulemaking efforts.

On the international front, DOT supports a uniform, global approach to the safe transportation of hazardous materials through participation in international organizations. According to RSPA officials, the US objective is to promote a worldwide system that affords the necessary consistency between modal and regional regulations that will guarantee the free movement of shipments. DOT officials are actively involved in a number of forums including: the UN Committee of Experts on the Transport of Dangerous Goods; the Dangerous Goods Panel of the International Civil Aviation Organization; the International

Maritime Organization's Subcommittee on Dangerous Goods, Solid Cargoes and Containers; and, the North American Free Trade Agreement Land Transportation Standards Subcommittee.

Data Collection

Each of the Operating Administrations collects and analyzes data associated with hazardous materials program delivery. Such data, if complete and accurate, could facilitate the measurement of intervention effectiveness, the identification of recalcitrant shippers and carriers, the development of risk management methodologies, and the allocation of resources.

RSPA maintains the HMIS, which is the source of safety data related to hazardous materials. The HMIS contains information on hazardous materials incidents, exemptions and approvals, enforcement actions, and other elements that support the regulatory program. Carriers in every mode of transportation, upon discovery of an unintentional release of hazardous materials, are required to file a report on DOT Form 5800.1. RSPA contractor personnel enter information from the form into the HMIS.

The Unified Shippers Enforcement System (UNISHIP), another RSPA-maintained database, is a cross-modal system to store information on enforcement actions taken against shippers and, to a limited extent, carriers and package manufacturers. The system allows enforcement personnel to determine if past violations of the hazardous materials regulations have been pursued by any DOT agency with respect to a particular entity or individual.

The other Operating Administrations also maintain relevant hazardous materials databases. The Coast Guard maintains the Marine Safety Information System which contains performance histories for vessels, facilities, involved parties, and hazardous cargoes. The Coast Guard also maintains the Container Inspection Program Information System to record the results of intermodal freight container inspections.

FRA maintains the Railroad Inspection Reporting System. This system records inspection reports noting such items as location, date, and areas of non-compliance. The information is used for identifying areas for additional focus and other program support needs. The FRA Office of Chief Counsel maintains the Enforcement Case System. This system records and tracks enforcement actions taken against companies or individuals found in non-compliance with regulations. FMCSA maintains the Motor Carrier Management Information System, which contains records of all inspections, reviews and enforcement actions conducted on carriers and shippers. FAA's Airport and Air Carrier Inspection Reporting System

captures inspection and outreach activity and incident data associated with the air transport of hazardous materials. A new module is currently being developed in FAA's Airport and Air Carrier Inspection Reporting System to capture shipper-related contact data. Another FAA database, the Enforcement Investigative System, is used to identify trends with respect to a particular air carrier, shipper, or freight forwarder, and allows field personnel to obtain the violation history of particular individuals or entities.

Compliance and Enforcement

In 1998, the Operating Administrations recorded 126,150 hazardous materials intervention activities ranging from the physical inspection of cargo tank cars, detailed compliance assessments or reviews of carriers, on-site post-incident investigations, resolution of violation cases, and outreach efforts. In addition, state employees conducted about 130,000 hazardous materials inspections under FMCSA's Motor Carrier Safety Assistance Program. However, care must be taken when analyzing performance based solely on the data representing intervention activity levels because the scope and depth of interventions vary greatly among the Operating Administrations.

The complexity of inspections affects the level of resources and time needed to perform interventions among DOT's Operating Administrations. For example, FAA conducted 2,559 air carrier assessments and inspections, of which 1,410 consisted of a comprehensive assessment, usually requiring 15-20 staff-hours of fieldwork. An air carrier assessment is a systematic evaluation of an entire operating facility, such as United Airlines' operations at Chicago-O'Hare International Airport. A typical assessment includes: reviewing enforcement history and previous assessments; reviewing training programs and records; monitoring carriers' acceptance procedures of hazardous materials shipments; and, inspecting hazardous materials packages to ensure shipper compliance with the HMR and International Civil Aviation Organization technical instructions.

The combined federal and state FRA inspection force conducted 89,633 rail tank cars and other rail car hazardous materials inspections, which typically take from 10 to 15 minutes per car. FRA inspectors also performed 3,617 shipper inspections, which range from half-a-day to an entire week, depending on the size of the facility and complexity of its operations. In addition, FRA conducted 134 inspections of tank car manufacturers or repair facilities, and 5,124 inspections of carriers or freight forwarders.

Coast Guard container inspections, which include an examination of the shipping papers, the container Safety Approval Plate, the external and internal structural condition of the container, the placarding, stowage, segregation, labeling and

packaging of the hazardous materials within the container, typically take 15 to 30 minutes. The Coast Guard also inspects freight forwarders, which perform both shipper and carrier functions such as document preparation, and intermodal container loading, and blocking and bracing. Additionally, the Coast Guard checks a variety of HMR requirements while conducting inspections of both domestic and foreign freight ships including reviewing dangerous cargo manifests, placarding, and cargo segregation and stowage. The HMR related portion of freight vessel examinations typically takes from 30 to 60 minutes.

RSPA inspects cylinder-retesting facilities, which include a review of records, observing the calibration of testing equipment and the actual testing of cylinders. Additionally, RSPA inspects manufacturer, inspection and repair facilities for intermediate-bulk containers, portable tanks, and performance-oriented-packaging. RSPA also conducts shipper inspections, including those shippers who hold exemptions or approvals or who have had a complaint filed against them. All of these inspections typically range in time from 2 to 8 hours, depending on the complexity of their operation.

Civil Penalty Process

Enforcement logically flows from inspection activities. Enforcement of the hazardous materials regulatory requirements is an important tool for improving compliance with the HMR. In 1998, the 5 DOT Operating Administrations initiated 24,609 enforcement actions, which included 1,487 civil penalty cases, 7,826 letters and reports of warning, 343 tickets, and 15,200 out-of-service orders. A total of $11.1 million in civil penalties was collected, although penalties collected generally relate to enforcement actions initiated or taken in prior years.

The Operating Administrations' civil penalty processes share the same core components. Detection of a violation triggers the process in each Operating Administration. An investigation follows to collect evidence, document that all the elements of a violation are present, and identify the culpable party. Enforcement options are weighed to determine the appropriate penalty. In determining civil penalty assessments, the Operating Administrations must consider nine statutorily mandated factors: (1) the nature of the violation; (2) circumstances of the violation; (3) extent of the violations; (4) gravity of the violations; (5) degree of culpability; (6) history of prior offenses; (7) ability to pay; (8) effect on ability to stay in business; and (9) such other matters as warranted.

Enforcement options include civil penalties, letters of warning, tickets, and detention orders. Only RSPA uses tickets while only the Coast Guard uses

detention orders.[32] The losses associated with detained or "frustrated" shipments are often a more severe penalty than a monetary fine and are "considered" when assessing the monetary penalty. Violators are offered opportunities for a hearing, and final decisions are rendered and penalties may be assessed.

One of the complaints voiced by industry during focus group meetings and in written responses to a HMPE Federal Register notice was that the violations cited and the penalties assessed varied significantly among the various regional offices within an Operating Administration, and among the Operating Administrations. For example, one Operating Administration may cite a carrier who failed to properly *describe* a hazardous material on the shipping papers with a single violation (49 CFR 172.200(a)). Another Operating Administration may cite a carrier with 6 or more violations for the same set of circumstances. Specifically, the Operating Administration may cite separate violations because the shipping papers did not include the proper shipping name, the hazard class, the identification number, and the packaging group of the hazardous material.

Typical penalty assessments and amounts actually collected are also indicative of differences among the Operating Administrations. During fiscal year 1997, average monetary penalties assessed ranged from $7,600 per civil penalty action for RSPA to $1,400 for the Coast Guard. Differences in typical penalty amounts among the Operating Administrations can also be attributed to the fact that each mode uses its own set of guidelines for assessing penalties for violations of specific regulations that are common to all. Notifications of the various penalty guidelines are not uniform either. FRA and RSPA published their guidelines in the Code of Federal Regulations. FAA's guidelines were published in the Federal Register. The Coast Guard issued its guidelines in an agency order, whereas FMCSA guidelines are incorporated in its Uniform Fine Assessment software program.

In 1998, DOT inspectors identified 95,361 violations of the HMR. These violations ranged from failing to have evidence of registration on a transport vehicle, to more serious safety violations such as filling a damaged cylinder with compressed gas, transporting a hazardous material displaying a POISON label with foodstuffs, and a failure to ensure the structural serviceability of a freight container carrying class 1 explosives.[33]

The most frequently cited violation of the hazardous materials regulations, representing over 20 percent of the violations identified, relates to the type of

[32] Detention orders are used by the Coast Guard based on authorities other than the HMR.

[33] A class 1 explosive is any substance or article, including a device, designed to function by explosion or by chemical reaction within itself.

placards each bulk packaging, freight container, transport vehicle, or rail car containing hazardous material must have on each side and at each end of the vehicle. The importance of a placard cannot be overstated. It constitutes the first warning that hazardous materials are present to those handling the materials and to emergency response personnel in the event of an accident. The next three most frequently cited violations deal with the preparation of the shipping papers, emergency response information, and general shipping and packaging requirements in that order. Together, these four areas accounted for 53 percent of the violations identified in 1998; in most instances, these types of violations are the fault of the shipper.

Outreach and Partnering

Each Operating Administration has implemented outreach programs designed to inform the industry and the public of the principles and application of the hazardous materials regulatory systems. These outreach efforts include distribution of informational brochures and pamphlets, presentations to various organizations and groups, individual contacts with shippers and carriers, and use of safety alerts and bulletins to provide better understanding of and compliance with the HMR.

RSPA's outreach program involves activities and programs designed to foster understanding and compliance with the HMR. One RSPA initiative is the operation of the Hazardous Materials Information Center (HMIC). Using a toll free telephone number, callers can resolve HMR issues with an Information Center Specialist. Additionally, callers have the ability to access an Automated Fax-Back system to obtain information on RSPA issued opinions, recent rulemaking actions, and specific exemptions. Callers also can be transferred to RSPA's Office of Hazardous Materials Initiatives and Training (OHMIT) to obtain informational brochures, literature, training tapes, and a training program contained on a compact disk for computer use. HMIC officials estimated that more than 50,000 telephonic contacts are made annually.

RSPA also oversees the development and distribution of the Emergency Response Guidebook. The Emergency Response Guidebook was developed jointly by the U.S. Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico. It is intended to be used by firefighters, police, and other emergency service personnel who are usually the first to arrive at the scene of a transportation incident involving a hazardous material. The Emergency Response Guidebook provides first responders with information to quickly identify the specific or generic classification of the hazardous material(s) involved in the incident and protect themselves and the general public during the initial response phase of the incident. To date, more than

seven million copies of the Emergency Response Guidebook have been distributed, without charge, to the emergency response community.

The RSPA also operates the Transportation Safety Institute (TSI) and sponsors the Cooperative Hazardous Materials Enforcement Development (COHMED) program. TSI's Hazardous Materials and Transportation Safety Division provides hazardous materials training for Federal agencies, industry, and state and local enforcement and emergency response personnel to better understand the complexities of the HMR and the motor carrier safety regulations. In FY 1998, approximately 2,400 officials attended 96 TSI classes and seminars. COHMED is an intergovernmental/industry partnership serving as a focal point for information sharing on hazardous materials transportation issues and delivery of services. More than 600 representatives of these various groups participated in the two COHMED conferences held in calendar year 1999.

An example of a FRA outreach program is the Safety Assurance and Compliance Program (SACP). The SACP process, which focuses on cooperative partnerships with railroads and systemic safety problems, consists of three major components: the safety profile, the safety action plan, and monitoring and enforcement. During the safety profile phase, FRA reviews a railroad to identify systemic safety issues and develops a safety profile of a railroad. In response to the safety profile, a railroad prepares and implements a safety action plan to address issues identified in the safety profile. FRA monitors a railroad's compliance with the safety action plan through continued follow-up with the railroad and the use of traditional site-specific inspections.

Typical of the other Operating Administrations' partnering activities is the Coast Guard's coordination of Multi-Agency Strike Force Operations, FAA's Hazstrikes, and FRA's Multi-modal inspections. FRA, for example, participated in over 70 multi-modal inspection activities in 1998. These operations can bring together inspectors from all the modes, as well as the Drug Enforcement Agency, Bureau of Alcohol Tobacco and Firearms, United States Customs Service, Animal Plant & Health Inspection Service, and state and local agencies to one port or air terminal area for a concentrated inspection activity. A typical strike force activity is of a week's duration. In addition to hazardous materials, areas of joint inspection include drug interdiction, traffic/vessel safety, weapons of mass destruction interdiction, and others. Check points are staffed by representatives from all agencies to maximize effectiveness and efficiency.

CHAPTER 6

PROGRAM DELIVERY ANALYSIS AND IMPROVEMENT STRATEGIES

The HMPE team concludes that an institutional capacity in DOT, located in either an existing or newly established office, is needed to identify areas where the Department's resources could be deployed more effectively by coordinating policy, strategy, and program objectives.

Hazardous Materials Program Needs Coordination, Direction, And Strategic Planning

The Secretarial delegations do not assign responsibility for managing and delivering a Departmentwide hazardous materials program to a single agency within DOT. Therefore, no entity in the Department is responsible for setting DOT-wide hazardous materials policy, establishing program objectives, or coordinating inspection/enforcement and outreach strategies. Neither is there central responsibility for overseeing budget and resource decisions from a Departmentwide perspective or for managing program databases. Without Departmentwide direction and oversight for the hazardous materials program, DOT will not be able to deploy its resources as effectively as it could and the risk to the public from hazardous materials will not be minimized.

Several earlier studies reached similar conclusions as the HMPE team about the need for better planning and direction for the Department's hazardous materials program. For example, in September 1978, a review conducted by a Departmentwide task force under the direction of the then Deputy Secretary recommended establishing a standing committee to provide a Departmental focal point for carrying out all hazardous materials programs.[34] As a result of that report, the Secretary, in 1978, agreed to institute a committee headed by the RSPA Administrator with the Administrators of FAA, FRA, and FHWA, the Commandant of the Coast Guard, and Secretarial officers as its members.

The 1978 task force recommended establishing a committee as a long-term solution, and cautioned that the committee should not be allowed to degrade over time. Specifically, the report stated "Care should be taken to prevent the Standing

[34] U.S. Department of Transportation, Deputy Secretary's Report of the Hazardous Materials Transportation Task Force, September 1978.

Committee from becoming a committee which discusses, but has no power to act, and gradually ceases to meet altogether." However, this is exactly what occurred. According to information provided by RSPA management, the appointed committee held only a few meetings. Instead, for many years RSPA's Associate Administrator for Hazardous Materials has chaired meetings attended by lower-level Operating Administration staff who deal with hazardous materials issues.

NTSB conducted a review that also had findings consistent with this report. NTSB's 1981 report on hazardous materials carried by trucks reported that RSPA had been unsuccessful in coordinating the modal hazardous material program because the agency was unable to exert influence over the larger Operating Administrations. The NTSB report documented a need for strong and clear direction from the Secretary.[35] Yet, almost 20 years later, the HMPE team found many of the same problems still affect the Department's hazardous materials program.

DOT's Strategic Plan and annual performance plans are intended to provide greater focus on the Department's strategic goals and help the Department manage for results. Unfortunately, DOT's Strategic Plan does not adequately address hazardous materials. Hazardous materials are not specifically addressed under the Strategic Goal for Safety and are only discussed as a candidate indicator under DOT's Strategic Goal for Human and Natural Environment. The low-level emphasis and lack of direction for the hazardous materials program in DOT's strategic and annual performance plans contribute to the continued uncoordinated aspects of the Operating Administrations' hazardous materials programs.

DOT's Performance Plan for 2000 contains a hazardous materials performance goal to reduce the number of serious hazardous materials incidents in transportation to 411 or fewer in 2000 from a peak of 464 in 1996. However, the serious-incident measure does not capture the hazardous materials program's performance. This is because the causes of most serious hazardous materials incidents are highway crashes due to driver fatigue, speeding, or other driver error. Because the HMR have no direct impact on reducing or controlling these factors, the performance goal does not measure hazardous materials program effectiveness.

DOT-Wide Program Coordination is Needed

The program delivery weakness is due primarily to the absence of a mechanism within DOT to ensure coordination or to develop objectives, strategies, or

[35] NTSB Safety Effectiveness Evaluation, Federal and State Enforcement Efforts in Hazardous Materials Transportation by Truck, NTSB-SEE-81-2, February 1981.

priorities for the Department's or the Operating Administrations' overall hazardous materials outreach, inspection, and enforcement activities. The Operating Administrations do not run their hazardous materials programs with a Departmentwide perspective, but rather run individual programs that are subsets of larger overall safety programs. There are opportunities to improve program delivery because over 14,000 hazardous materials incidents occur annually, and many, especially those in the air mode, have the potential for catastrophic consequences.

DOT needs to establish an institutional capacity for administering and delivering a coordinated DOT-wide hazardous materials program. Establishing a Departmentwide hazardous materials program with coordinated strategies, policies and program objectives would result in a more effective deployment of resources by focusing on problem areas identified through data and risk analyses, and by being able to quickly respond to emerging problem areas by redeploying resources.

Until such an institutional capacity is established and has the ability to identify resource priorities, the HMPE team recommends that the Department improve program delivery by placing additional emphasis on (1) shippers, (2) outreach programs, and (3) human factors/training.

Additional Emphasis Needed on Shippers, Outreach Programs, and Training

Congress has charged DOT to use its regulatory and enforcement authority to protect the nation against the risks to life and property inherent in the transportation of hazardous materials in commerce. The vast majority of hazardous materials is packaged in conformance with DOT's regulations and arrives at their destinations safely. Shippers and carriers have an interest in safety and, given the volume of shipments, the industry has a relatively good safety record. About 14,000 hazardous materials incidents are reported annually, and the vast majority (97 percent) do not meet RSPA's criteria for a "serious" incident. The extent to which DOT's and the Operating Administrations' efforts contribute to hazardous materials safety is difficult to measure and evaluate.

The HMPE team found that the hazardous materials programs cannot be measured solely by shipment and incident statistics. The programs operate as an element of the Operating Administrations' larger safety programs, and these broader safety programs often have a greater impact on reducing serious hazardous materials incidents than the hazardous materials programs themselves. For example, 73 percent of serious hazardous materials incidents are caused by motor vehicle crashes and railroad derailments, which generally are not directly affected by the

hazardous materials program, but rather by the overall safety programs of FMCSA and FRA. Yet these crashes and derailments would have been recorded as serious hazardous materials incidents since they involved a hazardous material and are currently used to measure the success of the hazardous materials program.

The HMPE team found that many elements of the hazardous materials program were working well. For example, there is multi-agency cooperation in coordinating rulemaking activities, routine bi-monthly program meetings among the Operating Administrations' staffs with hazardous materials responsibilities, and periodic joint inspections conducted by two or more Operating Administrations at airports, marine terminals, and other locations. However, there are opportunities to improve hazardous materials program delivery by increasing inspection and outreach emphasis on shippers, expanding outreach to the traveling public, and improving training for hazardous materials handlers.

The HMPE team concludes that Departmentwide program management and program delivery could be improved by establishing an institutional capacity with DOT-wide hazardous materials responsibilities. The new entity should have the following essential attributes related to cross-modal hazardous materials duties and responsibilities to:

- serve as the principal adviser to the Secretary on all intermodal hazardous materials matters;
- act as the focal point for review of hazardous materials policies, priorities, and objectives;
- provide oversight for planning and budgeting strategies for hazardous materials programs DOT-wide;
- resolve disputes among Operating Administrations on hazardous materials issues;
- provide external reviews and continual monitoring of DOT's hazardous materials programs; and
- coordinate DOT-wide hazardous materials outreach and data activities.

The new institutional capacity also should be tasked with addressing several regulatory and programmatic issues identified by the team during the program evaluation, but which were too complex or time consuming for this program evaluation. These issues are described in Chapter 9.

Other benefits result from establishing an institutional capacity, not the least of which are the ability to improve customer service to the hazardous materials community. In addition to being the focal point for hazardous materials policies,

priorities and objectives, the institutional capacity could be the focal point for contacts by the hazardous materials industry.

A number of the team's findings are supported by previous departmental studies. The need for DOT-wide planning and direction for the hazardous materials program was identified in a 1978 internal DOT study. In 1981, NTSB reported on the need for strong and clear direction from the Secretary in the hazardous materials program. Finally, the team does not believe the DOT Strategic Plan for 1997– 2002 provides adequate direction for the Department's hazardous materials program.

Greater Emphasis On Shippers

The Operating Administrations, with the exception of RSPA, have deployed their hazardous materials inspectors primarily at carrier operations. However, investigation and experience repeatedly identify the shipper, more often than the carrier, as the party most culpable for noncompliance with the HMR. The shipper is at the beginning of the transportation stream and the actions or inactions of shippers critically impact the safety of all those subsequently involved in transporting hazardous materials.

Safety in transportation begins with the proper classification and preparation of the material for shipment. As summarized in a certification on the shipping paper (a requirement of the hazardous materials regulations), the shipper must ensure that materials are properly classified, described, packaged, marked, labeled, documented, and in proper condition in accordance with the HMR. Once the package enters the transportation stream, if shippers have properly fulfilled their regulatory responsibilities, the package should withstand all forces incidental to the normal course of transportation. Table 6 details violations cited during inspections conducted in 1998.

Table 6
Violations Detected in 1998[1]

Section	Description	FAA	FMCSA	FRA	RSPA	USCG	Total
Shipper Violations							
	Special Provisions	0	0	10	0	0	10
	Shipping Papers	3654	10190	2938	174	80	17,036
	Marking	1587	2300	1767	47	73	5,774
	Labeling	1137	854	39	23	24	2,077
	Emergency Response	1743	4754	110	34	6	6,647
	General Requirements - Shipping & Packing	103	2806	2984	476	49	6,418
	Specifications for Tank Cars	0	0	269	0	0	269
Percentage of Total Violations							**40.1%**
Shipper or Carrier Violations							
	Program Procedures	0	3046	74	21	0	3,141
	General	1393[2]	1290	174	9	120[3]	2,986
	Placarding	2	15640	4192	2	136	19,972
	Training	751	0	2809	294	11	3,865
	Specifications for Packagings	5	2340	1	160	9	2,515
	Maintenance of packages	0	2787	62	2	0	2,851
Percentage of Total Violations							**37.0%**
Carrier Violations		257	16316	5068	2	157	21,800
Percentage of Total Violations							**22.9%**
Totals		**10,632**	**62,323**	**20,497**	**1,244**	**665**	**95,361**

[1] See Appendix VIII for a description of the violations identified in Table 6.

[2] Primarily violations of International Civil Aviation Organization (ICAO) technical instructions, which is authorized by 49 CFR 171.11 as an alternative to many of the hazardous materials regulations.

[3] Primarily violations of the International Maritime Dangerous Goods Code, which is authorized by 49 CFR 171.12 as an alternative to many of the hazardous materials regulations.

Source: Operating Administrations' enforcement databases and team analysis.

To determine how often shippers were found at fault, the HMPE team analyzed the 1998 violations of the HMR. As presented in Table 6, review of these data showed that roughly 40 percent of the violations were attributed to shipper functions, 37 percent could be attributed to either the shipper or the carrier, and almost 23 percent were attributed to the carrier.

The HMPE team believes additional effort should be placed on identifying high risk or problem shippers and address these individuals or companies on a Departmentwide basis. The Department conservatively estimates that there are 75,000 hazardous materials shippers in the United States, a total too great to be effectively inspected by DOT's limited inspector workforce. However, analysis of available information would assist the Department in targeting specific shippers. For example, the team's analysis of reported hazardous materials incidents for 1998 determined that 74 shippers were related to 29 percent of the nearly 15,000 reported incidents. However, two-thirds of these shippers have never been inspected or have not been inspected within the past 5 years. Further analysis of DOT's hazardous materials data should result in the further refinement and identification of problem shippers and a more effective use of inspection resources.

In addition, during the analysis of 1998 incidents, the team identified one problem shipper that appeared in 208 incidents reported by several different carriers and modes of transportation. Further analysis of 1993 to 1998 incidents, the motor carrier enforcement database, and UNISHIP showed this shipper has been the subject of closed enforcement cases by FAA, FRA, RSPA and Coast Guard, but no highway enforcement cases. Yet, highway carriers reported 99 percent of these incidents. Over the past 7 years, the annual number of incidents for this shipper has increased almost 850 percent.

The result of the HMPE team's analysis, that shippers are more often at fault, parallels the results of a 1993 report by the Transportation Research Board (TRB).[36] TRB reported that emergency responders expressed concern about the frequency of missing or incorrect placards and shipping papers (shipper responsibilities) at hazardous materials incidents.[37] Using FHWA data reflecting 1992, TRB reported that during roadside inspections, violations of federal requirements for placarding occur in about 30 percent of the trucks inspected, and violations of shipping paper requirements occur in about 25 percent. FHWA fiscal year 1998 data is slightly higher with improper placarding found on 32 percent of the hazardous materials vehicles inspected and violations of shipping papers found during 26 percent of inspections. A 1989 General Accounting Office report on FRA estimated that 75 percent of all hazardous materials releases could be traced to safety problems at shipper facilities.[38]

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[36] Transportation Research Board, National Research Council, Hazardous Materials Shipment Information for Emergency Response, Special Report 239, 1993.

[37] Although placarding is a joint shipper/carrier responsibility, in the highway mode the shipper is required to provide the necessary placards (49 CFR 172.506).

[38] U.S. General Accounting Office, DOT Should Better Manage Its Hazardous Materials Inspection Program, GAO/RCED 90-43, November 1989.

The HMPE team's review of FAA data for the past 3 years indicated that 139 of 158 (88 percent) of FAA's significant penalty assessments, defined as $50,000 or more, were against shippers. FAA found that these shippers were offering hazardous materials for transportation by air when they were not packaged, labeled, marked, classed, or in condition for shipment by air as required by the HMR. FAA is also finding that some shippers are failing to ensure employees are trained to properly package and handle hazardous materials. For example, in November 1999, FAA assessed a significant penalty against a shipper who offered for air transportation 525 cigarette lighters containing flammable gas. The lighters, contained in a fiberboard box, were not properly packaged, labeled, or marked and the shipper's employees were not properly trained.

The HMPE team also analyzed the HMR to determine the criticality of the shipper's role in hazardous materials. The HMPE team determined that approximately half of the HMR, roughly 500 pages, pertain to the shipper. During focus group meetings, it was reported that many small or one-time shippers are barely aware of the HMR, let alone capable of interpreting the complex provisions applicable to their shipments.

No DOT-wide Emphasis on Shippers

Lack of DOT-wide emphasis on shippers may be due in part to the fact that no organization within the Department has been delegated overall responsibility for reviewing each Operating Administration's enforcement and outreach programs, relative to shippers of hazardous materials, or for addressing problems with shippers**.** The HMPE team believes this is, in large part, because each Operating Administration, except for RSPA, has the responsibility for ensuring compliance with appropriate safety requirements for *both carriers and shippers using that mode*.

The modal orientation of the Operating Administrations has logically led to their safety programs focusing on carriers.[39] Moreover, compliance enforcement of the HMR is a small part of each Operating Administration's larger safety program. As a result, hazardous materials compliance generally receives little emphasis (hazardous materials expenditures only represented 1.6 percent of the 1998 safety budgets of the Operating Administrations with hazardous materials responsibilities) and shipper compliance with the HMR even less.

The HMPE team attempted to determine the degree of emphasis placed on shippers during Operating Administration inspection activities. Table 7 shows the

[39] FAA's work plan calls for one shipper inspection for each carrier inspection performed.

number of inspections performed in 1998 at the point where DOT intervenes in the transportation stream.

Table 7
Number of Inspections by Point of Intervention – 1998

Point of Intervention					
Agency	**Packaging/ Manufacturing**	**Shipper**	**Carrier/ Forwarder**	**Vehicles/ Railcars**	**Total**
FAA	N/A	208[1]	3,349	N/A	3,557
FMCSA	20	147	1,927	133,674[2]	135,768
FRA	134	3,617	5,124	89,633	98,508
RSPA	460[3]	1,256[4]	N/A	N/A	1,716
USCG	N/A	0	8,899[5]	0	8,899
Total	**614**	**5,228**	**19,299**	**223,307**	**248,448**

1 Reflects only Repair Station Assessments conducted for 1998. The FAA did conduct hazardous material shipper inspections in 1998; however, this activity was not tracked.
2. Vehicle inspections performed by state resources under the Motor Carrier Safety Assistance Program.
3. Includes container manufacturers and cylinder retesters/reconditioners.
4. Includes shippers and shipper observations, freight terminals/docks, and exemption and approval holders.
5. Includes both vessels examined and intermodal freight containers inspected.

N/A means not applicable to the agency.
Source: Operating Administrations' Inspection Databases

Table 7 shows DOT-wide that only 2 percent of all inspections are shipper inspections. However, this is misleading because it does not take into account the large variance in time and resources used to conduct these inspections. For example, a railcar inspection can take 5 to 15 minutes while a shipper inspection can take 2 or more days. The HMPE team could not compute the amount of inspectors' time spent at shippers because the Operating Administrations' inspector time distribution records do not provide the needed amount of detail. The team believes more emphasis should be placed on shippers because they are a common element across the Operating Administrations and they perform critical functions early in the transportation stream. Shippers can impact safety system-wide, particularly if the shipment is handled more than once or involves more than one mode of transportation.

An Effective Outreach Program is Needed to Influence Industry and the Traveling Public

The Department's limited inspection force can reach only a small portion of the hazardous materials community. With an estimated 1.2 million daily movements involving thousands of shippers and carriers, the Department's 256 hazardous materials inspectors can oversee only a very small percentage of the hazardous materials community. The Department must rely on industry and the public's voluntary compliance with the HMR if high levels of safety are to be maintained.

The HMPE team conducted a series of focus group meetings with representatives of the hazardous materials community, during which the participants cited frequent contact and outreach as the most effective interaction between the Department and the hazardous materials community. Industry believes the HMR are too complex for error-free implementation and that outreach is an effective means to educate industry and improve compliance. Most Operating Administrations do not maintain detailed statistics on outreach operations and attendance. RSPA data, however, showed that its enforcement office personnel conducted or participated in 45 outreach presentations to over 3,600 participants, such as shippers, packaging manufacturers, and Federal, state, municipal, and local agency officials in 1998. FAA data showed 83 outreach efforts, including presentations, briefings, and training workshops in 1998.

Additional outreach efforts should be directed toward the traveling public who often, unknowingly, bring hazardous materials into the transportation stream. Every day millions of travelers board planes, trains, ships, and buses unaware of the danger from the hazardous materials they may be carrying. The HMPE team also found that there are no Federal requirements to warn the traveling public of the restrictions on carrying hazardous materials in transportation, *except in the air mode*.

Even in the air mode, the team found that current passenger notification rules are ineffective. The HMR requires passenger and cargo facilities to post notifications pertaining to hazardous materials restrictions. According to the regulations, posting a sign at ticket counters and boarding areas may satisfy the requirement to notify airline passengers. However, the size and placement of the sign is not specified in the regulations. HMPE team members usually had difficulty locating the required notices in airports, and often had difficulty reading them when they were discovered because the notices were mounted at knee level in scale areas or were blocked by baggage. The team believes additional steps need to be taken much earlier in the transportation stream to increase awareness by the traveling public of the dangers posed by hazardous materials.

The consequences of hazardous materials incidents on aircraft can be particularly serious. According to air traffic data, the 50 largest United States airports account for over 650 million passengers each year. As a method of informing air passengers of potential risks, during 1996-1997, RSPA and FAA jointly created and distributed 6 million copies of a brochure titled "These Fly…These May Not" and placed them at major airports. The brochure described commonly carried consumer commodities, such as nail polish remover, that can pose a hazard in air travel when transported in sufficient quantities. FAA has investigated five incidents where micro-torches packed inside checked baggage either caught fire or

exploded during loading or unloading. Recognizing this weakness, FAA has developed and distributed to manufacturers and establishments selling the micro-torches a brochure to educate them about the dangers associated with the torches. Increased awareness, on the part of the traveling public, about the dangers of hazardous materials offers an opportunity for improving transportation safety, particularly flight safety.

Outreach efforts also need to concentrate on vehicular travelers. Highway deaths constitute the majority of all hazardous materials incident fatalities. According to FMCSA's annual profile of large truck crashes, the majority of the fatalities are the result of highway crashes between passenger vehicles and hazardous materials carriers hauling flammable liquids. FMCSA's annual profile also reports that roughly 75 percent of crash fatalities involve non-truck occupants, and based on police accident reports, 75 percent of the crashes were the result of some action of the driver of the passenger vehicle, primarily failure to yield. The HMPE team believes outreach directed at passenger vehicle drivers is another area warranting further attention. Passenger vehicle drivers should be taught to be sensitive to the need to provide sufficient clearance or operating distance for large trucks hauling hazardous materials, and taught to recognize the placarded carriers. Their actions could result in severe consequences involving a crash of a heavy truck hauling hazardous materials.

The HMPE team concluded that coordinated outreach programs could have a more effective impact. For example, the team's analysis of HMIS reported incidents for 1998 determined that 23 percent were from infrequent shippers. Infrequent shippers are too randomly situated to warrant any intervention except through some form of broad-based outreach. However, the HMPE team found that the Operating Administrations have not coordinated their outreach or training programs and no departmental organization has been given the authority or responsibility to coordinate these programs. The Department's hazardous materials outreach program would benefit from such a coordinated ONE-DOT effort.

As part of the program evaluation, the HMPE team participated in individual Operating Administration hazardous materials inspections and multi-modal strike force types of inspection activities. Although the various state and Federal inspectors exhibited knowledge of their modal specific and general requirements pertaining to hazardous materials, the team found improved cross-modal training would be beneficial to DOT inspectors. For example, the HMPE team found that inspectors from one Operating Administration were not fully aware of the more stringent blocking and bracing requirements for other modes of transportation. In addition, inspector training concerning use of hazardous materials segregation charts and modal specific quantity or packaging limitations could be improved. In

light of the ever increasing multi-modal nature of hazardous materials shipments, the team believes there is a need to review the training programs of DOT inspectors to ensure all DOT inspectors receive an adequate level of baseline training that gives the inspectors an understanding of the unique responsibilities and requirements for each mode of transportation.

The team also believes that the Department's hazardous materials program could be improved by the use of strike force inspection activities to cross-train inspectors as well as enforce regulations. Strike force operations concentrate inspectors from the Operating Administrations and other Federal, state, and local agencies at intermodal locations for a specific time period to conduct hazardous materials inspections of all modes of transportation using that targeted location. In addition to enforcing compliance, strike force operations can be used to train inspectors from one Operating Administration on the issues, problems, and regulatory requirements of the other Operating Administrations.

DOT Needs to Give More Attention to the Role of Training in Hazardous Materials Incidents

Both shippers and carriers must extensively rely on, and have little opportunity to confirm, each other's compliance with the HMR. The shipper has the greatest control over whether the material is properly classified, described, packaged, marked, labeled, documented, and in proper condition for transportation. In many cases, the carrier cannot view the packages offered by the shipper, particularly if they are offered in an intermodal container or truck trailer. Conversely, when the carrier owns the package, such as a cargo tank motor vehicle, the shipper expects the package to conform to the hazardous materials regulations necessary for their shipment.

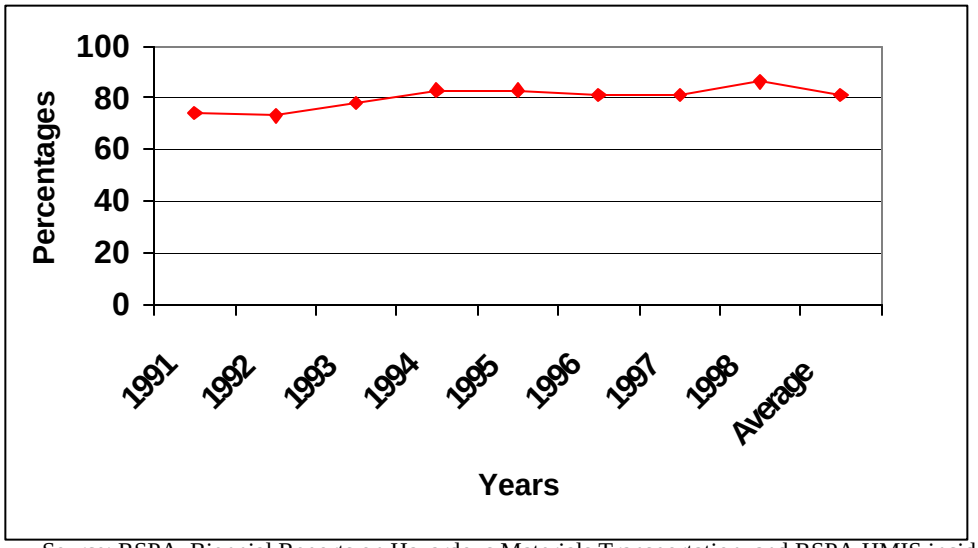
Regulatory compliance and transportation safety require hazardous materials employees to be trained. Congressional concern over the training of hazardous materials employees was expressed in 1974 and again in 1990. A 1990 Act required the Secretary to prescribe training requirements that hazardous materials employers must give hazardous materials employees on the safe loading, unloading, handling, storage, and transportation of hazardous materials.[40] RSPA issued training regulations in 1992.

However, the HMPE team found that employee training is still a problem. RSPA data show that from 1991 through 1998, human error was the contributing factor in roughly 80 percent of hazardous materials incidents and that the training standard has had no discernable influence on the percentage of hazardous

[40] Public Law 101-615.

materials incidents attributable to human error.[41] Figure 8 shows the percentage of incidents caused by human error from 1991 through 1998.

Figure 8
Percentages of Hazardous Materials Incidents
Attributable to Human Error - 1991 through 1998



Source: RSPA, Biennial Reports on Hazardous Materials Transportation, and RSPA HMIS incident database as of October 21, 1999.

The HMPE team believes hazardous materials safety could be improved by ensuring that hazardous materials employees are adequately trained. The provisions in the HMR employee-training standard do not ensure employees are adequately trained to carry out their functions. There is no requirement to show that a minimum level of knowledge was obtained. For example, while there is a requirement that hazardous materials employees be trained and tested for general hazardous materials awareness and job-specific safety requirements, there is no standard curriculum, no requirement that employees have to actually pass the test, and no requirement for the employer to maintain a copy of the employees' test results.

In addition, decisions about which employees need to be trained and how much training they need to receive is left to the discretion of the employer. As a result, it is difficult for the Operating Administrations to evaluate the competency of hazardous materials employees who handle hazardous materials. A more stringent training requirement could reduce the number of incidents caused by human error, the leading cause of hazardous materials incidents.

[41] Although the HMPE team's analysis of 1996 HMIS data identified a lower percentage of hazardous materials incidents attributable to human error than RSPA's statistics, 62 percent versus 81 percent, human error continues to be the single greatest contributing factor in hazardous materials incidents.

Compliance with the HMR by a well-informed, fully-trained workforce is essential. There is a need to do more to address the human error factor by achieving more through training, education and outreach. Ensuring that shippers and carriers adequately train employees may be DOT's best approach to achieving better compliance with the HMR.

Potential Legislative, Regulatory, and Other Issues

The HMPE team also identified potential legislative, regulatory, and other issues related to DOT's Hazardous Materials Program that could benefit from further assessment and analysis. These include: gaining a better understanding of industry practices related to undeclared shipments; examining ways to clarify and improve the effectiveness of the hazardous materials regulations, including a review of the adequacy of "performance-oriented packaging" requirements; increasing cooperation with the United States Postal Service to identify potential safety gaps related to hazardous materials shipments by mail; enhancing enforcement authority; and identifying better measures for the DOT-wide performance plan that more fully reflect the hazardous materials program. Chapter 9 contains a detailed discussion of these areas.

CHAPTER 7

DATA ANALYSIS AND IMPROVEMENT STRATEGIES

The HMPE team was sufficiently hampered in its ability to obtain data to perform analysis that it concluded that data deficiency problems are an important issue to bring to the attention of DOT leadership. The lack of sufficient, reliable, and timely information limits the Department's ability to make informed program delivery decisions. All facets of the program are affected, from program planning through inspections and outreach to estimating resource needs. The team also found the Department does not have a coordinated, DOT-wide plan to improve its hazardous materials data or use the data to manage the program.

DOT Does Not Have Accurate Information On the Hazardous Materials Industry

The Department's hazardous materials programs are hampered by a lack of sufficient, reliable, and timely information on which to evaluate the effectiveness of actions taken or base program delivery decisions. Although the Department has general information, it does not have specific, detailed information on the hazardous materials community. Specifically, the Department does not have sufficient information on the:

- population and identity of shippers and carriers of hazardous materials;
- frequency, amounts, and types of hazardous materials each shipper or carrier transports;
- number of hazardous materials incidents occurring annually and their causes; and
- amount of funding and staffing resources the Department spends on hazardous materials activities.

Identification of Shippers and Carriers of Hazardous Materials

None of the data systems employed by the Department have been designed to contain sufficient information on shippers and carriers of hazardous materials for DOT to effectively manage its programs. This lack of information is evident upon review of key DOT databases, such as RSPA's registration database; DOT's Unified Shippers Enforcement Data System (UNISHIP); and, FMCSA's Motor Carrier Management Information System database.

Shipper Identification

Under the HMTL some, but not all, hazardous materials shippers and carriers are required to register annually with the Department.[42] A shipper or carrier must register if it offers or transports:

- certain quantities of dangerous radioactive materials;
- certain quantities of explosives;
- certain quantities of the most lethal poison by inhalation;
- hazardous materials in bulk packages that have a capacity of more than 3,500 gallons; or
- shipments of non-bulk packages of 5,000 pounds or more that require placarding.

RSPA has recently issued a final rule to expand the registration criteria to include, with limited exception, all placarded shipments of hazardous materials.[43] While this action will help to fill in some of DOT's information gaps, RSPA could use its full authority to extend the registration requirement to all shippers and carriers of hazardous materials. The registration process is also exempt from the requirements of the Paperwork Reduction Act of 1980 and RSPA could collect additional information without significant paperwork obstacles.[44] Therefore, RSPA could require all shippers and carriers to register and provide some information on hazardous materials, which would assist the Department in implementing its hazardous materials program.[45]

No DOT-wide Shipper Identification Number

The Department does not have a single shipper identification number used by all Operating Administrations in their compliance records. The HMPE team believes such an identification number is necessary to track shipper compliance with the HMR. In 1981, NTSB recommended RSPA develop a Departmentwide common shipper designator for all compliance records.[46] RSPA's final response, dated July 8, 1994, indicated that such a system, "UNISHIP," would fill this need.

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[42] 49 CFR Part 107.601-620.

[43] Docket No. RSPA-99-5137 (HM-208C) Federal Register/Vol. 65, No. 30, Page 7297, February 14, 2000.

[44] Title 49 U.S.C. § 5108(i).

[45] RSPA can establish volume/quantity thresholds below which registered infrequent shippers and carriers would not pay a registration fee.

[46] NTSB Safety Effectiveness Evaluation, Federal and State Enforcement Efforts in Hazardous Materials Transportation by Truck, NTSB-SEE-81-2, February 1981.

The HMPE team has found that UNISHIP does not meet the 1981 NTSB recommendation to "Develop and use a common shipper identifier in all DOT hazardous materials compliance records." Rather, the HMPE team found that the Operating Administrations do not use or reference the UNISHIP identification number in their compliance databases, but instead assign their own unique identifiers. This results in inconsistent identifiers within the Department for a single shipper with no ability to track problem shippers.

Other UNISHIP Weaknesses

DOT developed the UNISHIP system in response to a 1991 General Accounting Office audit report that found that neither RSPA nor the other Operating Administrations maintain complete noncompliance or violation histories on shippers and carriers.[47] The HMPE team found that the UNISHIP database does not include a complete history of all shipper compliance inspections. Instead, it contains only closed enforcement cases pertaining to shippers, (including freight forwarders). The lack of current inspection information or pending enforcement actions limits UNISHIP's effectiveness. Sharing information on enforcement actions would assist the Operating Administrations in identifying and prioritizing shippers to inspect. Such information would also be useful in determining appropriate penalty amounts to assess violators since agencies are required by statute to consider prior knowledge and violations when assessing penalties.[48]

Another UNISHIP database limitation is the lack of timely information. The Operating Administrations are not updating the database frequently enough for it to be of maximum value to all inspectors. RSPA has asked, because it has no DOT-wide authority to require, the Operating Administrations to voluntarily update the database quarterly. Our review found that only FAA and RSPA were doing so; the other Operating Administrations were providing only annual updates. We also found that, with minor exception, only FAA and RSPA were using the UNISHIP database. In 1998, DOT employees accessed UNISHIP 629 times, 51 percent by FAA, 47 percent by RSPA, and 2 percent by the other Operating Administrations.

Carrier Identification

There are 46,000 full-time hazardous materials motor carriers registered with DOT. The most recent audit of the FMCSA noted there were serious data

[47] U.S. General Accounting Office, Information Strategy Needed for Hazardous Materials, GAO/IMTRC-91-50, November 1991

[48] Title 49 U.S.C. § 5123.

completeness, accuracy, and timeliness issues with carrier profiles.[49] Consequently, the Department does not know how many other general carriers are hauling hazardous materials. As noted earlier, there are roughly 500,000 *potential* hazardous materials carriers in the United States. The Department also does not have sufficient data on the quantity, type, and frequency of hazardous materials products transported. Although the Operating Administrations have developed some of this information, it is not complete, and no specific DOT requirement exists to develop a system to obtain complete information. Furthermore, none of the Operating Administrations have authority to require carriers to report this information. For example:

- FMCSA is in the process of revising its regulations to require carriers to submit periodic updates, but such updates would not include the quantity or frequency of data mentioned above.

- FRA, because of Interstate Commerce Commission (now Surface Transportation Board) regulations, receives waybill data. However, even these limited shipment data are not comprehensive enough to ascertain the number of shipments and movements by class of hazardous materials.

- The Department of Commerce and BTS's Commodity Flow Survey (CFS) contains data on hazardous materials. The data are limited because they focus on commodities and sample only domestic manufacturers, only some of which are hazardous. The Commodity Flow Survey is further limited because it is conducted only every 5 years and does not include reshippers or major retail companies.

- RSPA's internal study of incident report data includes a recommendation to provide classification codes to support limited matching with CFS data. This October 1998 study is still in draft, and CFS data released since then use more extensive classification systems that provide greater possibilities for matching.

As indicated above, these data collection limitations hamper DOT's ability to effectively allocate scarce resources. There are initiatives within the Department to improve data. However, these initiatives lack the coordination and emphasis necessary to meet Departmentwide needs.

[49] Office of Inspector General, Motor Carrier Safety Program, Report No. TR-1999-091, April 1999

Data on Shipments and Movements of Hazardous Materials Not Reliable

The Department does not have reliable hazardous materials traffic estimates. The best available data on hazardous materials flows are derived from CFS data. In 1998, RSPA's Office of Hazardous Materials Safety conducted a study to determine the number of hazardous material shipments and movements occurring in the United States.[50] The information collected from the Census Bureau's 1993 CFS was used in conjunction with other data to develop shipment and movement estimates. However, the CFS is not designed to capture specific information on the transportation of hazardous materials shipments or movements. Rather, the survey was a broad sample of 200,000 domestic manufacturers that produce and ship commodities, only some of which are hazardous. RSPA is in the process of updating its shipment and movement study using information from the 1997 CFS. The CFS contains an improved method for identifying hazardous materials.

The CFS covers shippers in manufacturing, mining, wholesaling, and selected retail establishments. However, it does not include shipments by governments; service industries, such as hospitals, and other sources of hazardous materials shipments. Furthermore, the CFS does not cover imports or shipments between foreign origins and destinations that move through the United States (particularly between Canada and Mexico). The biggest limitation is that the CFS sample is designed to collect general commodity information; it is not targeted at hazardous materials shipments.

Finally, CFS is further limited for hazardous materials program purposes because it does not sample governments, foreign establishments, and most business establishments in the retail and service sectors, many of which ship hazardous materials. For example, a nationwide retail outlet shipping lawn chemicals, and many similar businesses transporting such items as pool supplies and chlorine bleaches would not be sampled. Yet these establishments, sometimes referred to as reshippers, are responsible for introducing large volumes of hazardous materials into the transportation stream, either via shipments or transporting the products themselves.

Need to Improve and Expand DOT's Hazardous Materials Information System

RSPA's Hazardous Materials Incident Reporting Subsystem (HMIRS), a part of the HMIS, is intended to be the DOT repository of hazardous materials incident

[50] RSPA study prepared by the Office of Hazardous Materials Safety on Hazardous Materials Shipments, October 1998.

information. Carriers that experience an unintentional release of hazardous materials during transportation, including loading, unloading, or temporary storage, are required to submit an Incident Report Form DOT 5800.1, to RSPA (see Appendix VI). This incident is then entered into the HMIRS. However, the team's review of the HMIRS found that all incidents are not reported, and the data are incomplete in numerous areas, particularly in identifying the root cause of incidents. As discussed in Chapter 4, the HMPE team performed an independent analysis of 1996 incident reports and found many inaccuracies with regard to the causes of hazardous materials incidents. For example, the HMPE team's analysis identified human error as the cause of 62.4 percent of hazardous materials incidents versus 80.7 percent identified by RSPA.

In addition, the HMPE team compared information contained in reports to the National Response Center (NRC), which receives all telephonic reports of incidents, with HMIRS information. The team found incidents, both serious and nonserious, that were not reported to RSPA. For example, the HMPE team reviewed 12 NRC incident reports which appeared to meet RSPA's criteria for serious incidents. The following 3 serious incidents were not included or reported correctly in the HMIRS:

- A tank truck overturned and spilled 10,000 gallons of gasoline, which polluted a local river and resulted in road closure. HMPE telephone discussions with the on-scene coordinator determined the vehicle rolled over while negotiating a tight entrance ramp. Based on a review of the NRC summary report, this incident should be considered a serious incident because of the road closure. Yet, our review of the HMIS determined that the motor carrier had not filed an incident report with RSPA.

- A tank truck rolled over and spilled 3,500 gallons of diesel oil, which caught fire and subsequently leaked into a nearby storm drain. HMPE telephone discussions with the on-scene coordinator indicated the interstate highway was closed for several hours during cleanup operations. Therefore, this incident meets the definition of a serious incident. Our review of the HMIS, however, determined that the motor carrier had not filed an incident report with RSPA.

- A flatbed tractor-trailer overturned and spilled 44,000 pounds of sodium hydrosulfide, which reacts with water. HMPE telephone discussions with the on-scene coordinator indicated the initial fire department response was to use water to combat the fire. This action caused explosions and elevated the degree of danger. Because of the fire and explosion, the cleanup took 36 hours and involved the evacuation of several families, as

well as a road closure. Thus, this incident should be considered a serious incident. Our review of HMIS data determined a report had been filed within 2 weeks of the incident. However, the report did not indicate the fire, explosions, and road closure. The vehicle (package) was incorrectly reported as a cargo tank when in fact the hazardous materials were packed in 2-ton tote bins loaded on the flat-bed trailer. Finally, the report did not correctly identify the hazard class.

In 1986, the Office of Technology Assessment conducted an examination of the HMIS and found that approximately 50 percent of the most serious hazardous materials incidents may not be reported. The Office of Technology Assessment identified intrastate highway and bulk marine transport incidents as significant omissions.[51] An October 1998 draft report on a review of the HMIRS conducted by RSPA noted the level of underreporting of incidents is unknown but could be significant.[52] The underreporting of hazardous materials incidents can seriously influence the level of resources deemed appropriate to ensure the safe transport of hazardous materials. The Department needs to be able to better define the level and types of hazardous materials activity in the transportation stream so that it can deploy appropriate resources for maximum benefit. Beginning with fiscal year 1999, the hazardous materials incident-reporting requirement was extended to intrastate motor carriers, which should better capture the full extent of hazardous materials incidents.

The HMPE team also reviewed 1996 incident reports, the baseline year for DOT's hazardous materials performance goal, to identify reporting patterns that could indicate inaccurate reporting, such as questionable damage report figures. One large motor carrier that accounted for 1,459 incidents - 10 percent of the year's total - was reviewed by the HMPE team in more detail. The review showed that for over 90 percent of the incidents, the carrier reported the same incident consequences ($125 in damages, no injuries, and no evacuations), regardless of the type or quantity of material involved or the location of the incident. At the least, these apparently standard entries should have led RSPA to question the accuracy of the reports and suggests RSPA's review of incident reports is not adequate. Improved data would indicate the true extent of damage caused by carriers reporting to RSPA and assist DOT in better determining resource allocation.

RSPA does not validate incident data unless the incident involves a fatality or a serious injury, or the quality of information is such that the carrier must be contacted. RSPA officials told us they were aware of some of the problems, such

[51] Office of Technology Assessment, Transportation of Hazardous Materials, July 1986.

[52] RSPA Office of Hazardous Materials Planning and Analysis, Hazardous Materials Information System (HMIS) Incident Reporting Subsystem Review, October 1998.

as failures to report the exact cause of an incident or where an incident actually occurred (versus where the spill was discovered). Currently, RSPA has an open rulemaking to address a number of these deficiencies.

RSPA's draft HMIS review report found that the system does not contain information sufficient to conduct risk analysis. Such information includes transportation system conditions; loading, unloading, storage and transfer facility conditions; detailed packaging information; and vehicle and human factors information. This report also found that HMIS data are limited in their ability to support cause-and-effect analyses, primarily because insufficient information is collected on root cause. For example, the root cause of a leak from a loose valve may be that corrosion prevented the valve from being sufficiently tightened. This lack of adequate information could lead DOT to take inappropriate action directed at the training of employees rather than at the maintenance of tank cars.

The draft study also examined additional data sources, both within and external to DOT, to determine whether they could be used in conjunction with HMIRS to address any identified data needs. The study concluded that weaknesses in the existing HMIRS data could not be supplemented by using these additional data.

Budget and Staffing Data Not Readily Available

With the exception of RSPA, the Operating Administrations do not have line items in their budgets for hazardous materials activities. For example, FAA officials estimated that 70 percent of their budget for Dangerous Goods and Cargo Security was used for dangerous goods (hazardous materials) activities. FRA's estimate, on the other hand, is based on the ratio of hazardous materials staffing to total Office of Safety staffing. The HMPE team, working with Operating Administration personnel, developed estimates showing the Department spent $36.6 million on the hazardous materials program in 1998, which equates to 1.6 percent of the Department's total safety budget. Table 8 shows the HMPE team's breakdown of the Department's estimated hazardous materials program funding for 1998 by Operating Administration.

Table 8
1998 Estimated Hazardous Materials
Program Funding by Operating Administration

Agency	Total Safety Budget ($ million)[1]	Hazardous Materials Budget[2] ($ million)	Hazardous Materials as a Percent of Safety
FAA	$ 986	$ 8.0	0.8
FMCSA	365	2.5	0.6
FRA	86	6.5	7.5
RSPA	60	15.4	25.7
USCG	866	4.2	0.5
Total	**$2,363**	**$36.6**	**1.6**

[1] Source: DOT Performance Plan Fiscal Year 2000 (which contained 1998 budget data).
[2] Source: Information gathered by HMPE team from agency organizational data and modal HMPE team member program knowledge.

The HMPE team also estimated that 389 staff years were spent on hazardous materials activities in 1998. This consisted of 256 years by inspectors, 113 by headquarters personnel (87 of which are RSPA employees) and 20 by attorneys. Table 9 shows the breakdown by Operating Administration of the estimated staffing for the hazardous materials program in 1998.

Table 9
1998 Estimated Hazardous Materials Program
Staffing by Operating Administration

Agency	Field Inspectors/ Specialists	Headquarters Personnel	Attorneys	Total
FAA	95	6	12	113
FMCSA	23	3	1	27
FRA	55	7	1	63
RSPA	32	82	5	119
USCG	51	15	1	67
Total	**256**	**113**	**20**	**389**

Source: Information gathered by HMPE team from agency organizational data and program officials.

More accurate information on hazardous materials funding and staffing is needed by the Department to accurately assess program effectiveness and sufficiency of resource deployment. Such determinations are required under the GPRA and could serve to target resources in a more effective manner.

Need for a Departmentwide Data System Widely Recognized

Over the past 20 years, several reports conducted by or for the Department have criticized the lack of a single Departmentwide data system. The 1978 DOT Task Force found that each Operating Administration "involved with hazardous

materials performs its own data collection and data analysis…. These information systems are inadequate for comprehensive program planning and analysis."[53] The report recommended that the Department's hazardous materials data collection systems be strengthened and centralized and become the basis for hazardous materials program planning, regulation development, enforcement, and program evaluation.

The 1980 GAO report found that the Department had not developed an information system that is complete or accurate, or which allowed for comprehensive planning and analysis of the hazardous materials program. As a result, the Department can neither determine the extent of problems involved in transporting hazardous materials nor ensure Congress - and the American public - that it is using its limited staffing and funding resources in the most efficient and effective manner.[54] The report also stated that, historically, DOT did not have the critical information necessary to manage its hazardous materials program. The HMPE team concluded that these findings are still valid.

The 1993 TRB report stated that no comprehensive national census or representative sample of hazardous materials incidents exists.[55] The report recommended DOT's incident reporting processes "…should formally coordinate to ensure that data are defined and collected uniformly, duplicate reporting is avoided, and data collection is designed to serve essential program evaluation and research needs."

The HMPE team found that the conditions cited in these earlier reports are basically unchanged. The Department continues to operate hazardous materials programs without the benefit of reliable data. It is extremely difficult for the Department, because of data deficiencies, to meet its statutory requirement to report on the effectiveness of the hazardous materials enforcement activities, and the degree of voluntary compliance.[56] Furthermore, the lack of quality data severely limits the Department's ability to perform any level of program analysis or have confidence that it has sufficient resources to discharge its responsibilities. Data limitations also prevent DOT from reporting on the effectiveness of the hazardous materials program as it is required to do in its biennial report to Congress on hazardous material transportation.

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[53] U.S. Department of Transportation, Deputy Secretary's Report of the Hazardous Materials Transportation Task Force, September 1978.

[54] U.S. General Accounting Office, Programs For Ensuring The Safe Transportation of Hazardous Materials Need Improvement, GAO/RCED-81-5, November 1980.

[55] Transportation Research Board, Hazardous Materials Shipment Information for Emergency Response, Special Report 239, 1993.

[56] Title 49 U.S.C. § 5121.

CHAPTER 8

CONCLUSIONS, RECOMMENDATIONS, AND SENIOR LEADERSHIP RESPONSE

DOT-wide Hazardous Materials Program Coordination Issues

DOT has not achieved a Departmentwide approach to implementing its hazardous materials program. Moreover, the program lacks sound strategic planning and coordinated DOT-wide direction. As a result, DOT is unlikely to improve, and because of forecasted growth may not maintain, the existing level of safety in hazardous materials transportation.

The HMPE team concluded that the Department's hazardous materials program needs to be more focused and better coordinated to ensure a high level of safety and establish an effective, vigilant, and visible ONE-DOT hazardous materials program. We conclude that little has changed over the past 20 years in terms of strategic planning, program direction, and program delivery despite recommendations for change by both internal DOT and external groups. Need for a Departmental focal point on hazardous materials continues to be critical.

An earlier effort by the Department to correct these problems by establishing a Standing Committee, chaired by the RSPA Administrator, failed to adequately institutionalize oversight responsibility. The Department needs to develop and implement an improved and lasting Departmentwide approach for its hazardous materials program if it intends to improve strategic planning and program coordination and achieve a hazardous materials program that reflects ONE-DOT.

The team makes the following recommendations:

Recommendation 1. We recommend that the Secretary **c**reate an institutional capacity, complementary to the Operating Administrations at the Departmentwide level, to facilitate program coordination and direction to provide for more effective deployment of DOT's hazardous materials resources. The institutional capacity would administer and deliver a Departmentwide hazardous materials program to strengthen strategic planning, program coordination, and program delivery. It would have the authority to establish DOT-wide policy, program objectives and priorities, and focus budget and resource strategies. A Departmentwide hazardous materials program can best be instituted by delegating authority to a new or existing entity to be responsible for the program.

The HMPE team believes there are several attributes that are essential to the new institutional capacity achieving a DOT-wide hazardous materials program. Its delegated mission must be to:

- serve as the principal adviser to the Secretary on all intermodal hazardous materials matters;
- act as the focal point for review of hazardous materials policies, priorities, and objectives;
- provide oversight for planning and budgeting strategies for hazardous materials programs DOT-wide;
- resolve disputes among Operating Administrations on hazardous materials issues;
- provide external reviews and continual monitoring of DOT's hazardous materials programs; and
- coordinate DOT-wide hazardous materials outreach and data activities.

The new institutional capacity also should be tasked with addressing several regulatory and programmatic issues identified by the team during the program evaluation, but which were too complex or time consuming for this program evaluation.

By delegation of authority, the Secretary should establish a Departmentwide hazardous materials safety organization, located either within the Office of Intermodalism or as a separate organization within RSPA. The first tasks of this organization should be to implement the recommendations of this report and oversee the examination of the issues identified in this report as areas for further analysis identified in Chapter 9.

Recommendation 2 We recommend that the Department should place more emphasis on hazardous materials in its Strategic Plan Goal for Safety and in its Performance Plan. Revisions to the Strategic Plan and Performance Plan would help ensure the Department fulfills its responsibility to adequately protect the nation against risks inherent in the transportation of hazardous materials. DOT's revised strategic plan needs to: (1) specifically identify and address hazardous materials safety within DOT's broader safety goal; (2) provide a statement, together with appropriate strategies, to recognize and achieve DOT's additional hazardous materials responsibilities related to uniformity, efficiency, and emergency response; and (3) ensure that the appropriate operating administrations within DOT are held accountable for achieving the hazardous materials strategic and outcome goals. DOT's performance measure(s) also need to be revised to fully reflect DOT's safety and related responsibilities. Developing a set of measures is identified in Chapter 9 as an area meriting further examination.

Program Delivery Issues

The Department needs to focus its program delivery efforts differently to maintain or improve the existing level of safety. Shippers of hazardous materials receive less attention than warranted due to their importance to the safe transport of hazardous materials and by inspection results; yet they provide the Department with the greatest potential to impact safety early in the transportation stream. Human error continues to be the single greatest contributing factor to hazardous materials incidents and DOT has not been effective in changing this trend. Finally, the traveling public is largely unaware of the dangers inherent in carrying hazardous materials in all transportation modes. The HMPE makes the following recommendations to improve program delivery:

Recommendation 1. We recommend that the Department's new institutional capacity develop DOT-wide strategies and actions to focus more outreach and inspections on high risk or problem shippers. Shippers are the entry point for hazardous materials in commerce and their level of compliance with the HMR impacts everyone in the transportation stream, including emergency responders.

Recommendation 2. We recommend that RSPA work with the other Operating Administrations and industry to enhance the regulations addressing training and the enforcement of those requirements. Training is one of the most effective tools available to the Department to improve compliance with the HMR. Rigorous training efforts targeted to high-risk points in the process are likely to be effective in reducing hazardous materials incidents. Such a targeted training program would allow the knowledge of hazardous materials risks to filter downstream to dock workers, drivers, re-shippers, and infrequent users/shippers. Key elements of a training standard should include training targeted to material operators, handlers, and shippers and testing to ensure that those who handle hazardous materials are knowledgeable about how to deal safely with them and with the potential for serious consequences if the hazardous materials are improperly handled.

Recommendation 3. We recommend that the newly established institutional capacity work with the Operating Administrations to review the training programs of DOT inspectors to ensure all DOT inspectors receive an adequate level of baseline training that gives the inspectors an understanding of the unique responsibilities and requirements for each mode of transportation.

Recommendation 4. We recommend that the institutional capacity at the DOT-wide level should coordinate an effort for the Operating Administrations to develop a nationwide hazardous materials awareness program for the traveling public. One element of such a program could include broadcasting information on the dangers of hazardous materials in luggage or items commonly shipped as

cargo. A second element would raise the public's awareness to the dangers of providing insufficient clearance or operating distance to large trucks hauling hazardous materials. A broad nationwide campaign could mirror the successful public service announcements used by DOT's National Highway Traffic Safety Administration to increase seat belt usage. The traveling public needs greater awareness about the dangers posed by hazardous materials.

Data Issues

The Department is hampered by the lack of accurate and complete information with which to evaluate program effectiveness and to make basic program delivery and resource decisions. In addition, the Department is unable to precisely gauge the effectiveness of its hazardous materials program or develop better risk-based regulations. The HMPE team makes the following recommendations.

Recommendation 1. We recommend that the Department task the Bureau of Transportation Statistics to lead a project, supported by the Operating Administrations and coordinated by the new institutional capacity at the DOT-wide level, to identify data needs and develop plans to acquire the necessary data and analyze that data. The project should include an evaluation of the costs and benefits of acquiring data on the:

- population and identity of shippers and carriers of hazardous materials;
- frequency, amounts, and types of hazardous materials each shipper or carrier transports;
- number of hazardous materials incidents occurring annually; and
- causes of hazardous materials incidents.

Recommendation 2. We recommend that the Department task the Bureau of Transportation Statistics to identify and implement ways to improve the HMIS and UNISHIP databases to increase their usefulness to the Operating Administrations. The HMIS should include more specific information on incident causes. Modes should be required to more frequently report shipper inspection results to RSPA for inclusion in the UNISHIP database. These actions would improve RSPA's ability to determine incident causes and assist the Department in identifying repeat offenders for inspection and establishing penalty amounts.

Recommendation 3. We recommend that BTS and RSPA work together to design a process to more fully evaluate and analyze existing incident data to develop a better understanding of the root causes of hazardous materials incidents. Identifying root causes would assist the Operating Administrations in finding ways to resolve the problems, especially if root causes go beyond hazardous materials

and are directly related to broader safety issues, such as operator fatigue or excessive speed, or unsafe driving practices by other drivers.

Recommendation 4. We recommend that the Secretary delegate to the newly established institutional capacity authority to develop a consistent approach for the Operating Administrations to conduct on-site investigations to determine the root causes of hazardous materials incidents.

Recommendation 5. We recommend that RSPA accelerate improvements to the accuracy and completeness of incident data on causes and locations of incidents reported on DOT Form 5800.1.

Recommendation 6. We recommend that the new institutional capacity work with the Operating Administrations and Assistant Secretary for Budget and Programs/Chief Financial Officer to improve identification of budget and staffing information.

DOT'S SENIOR LEADERSHIP RESPONSE

The program evaluation found that DOT's hazardous materials programs works reasonably well but needs to be improved through DOT-wide strategic planning and program coordination, more focused delivery, and better data.

To address the recommendations contained in the report, DOT's Deputy Secretary met with the HMPE Sponsors (the Assistant Secretary for Budget and Programs/Chief Financial Officer, the Inspector General, and the Administrator, Research and Special Programs Administration) and the HMPE team on December 14, 1999, to provide input and direction. The Deputy Secretary asked for two subsequent meetings on January 13, and March 16, 2000 with the HMPE Sponsors, the team, and DOT's Senior Leadership Team (comprised of DOT's Secretarial Officers and Heads of Operating Administrations). During February, the Heads of Operating Administrations with hazardous materials responsibilities and selected Secretarial Officers reviewed drafts of the report and provided the HMPE team with their technical and substantive comments which were incorporated in the final report.

On January 13th, the HMPE team briefed the Senior Leadership Team on each of the recommendations contained in the report. At this meeting, the Deputy Secretary asked the HMPE team to meet with senior policy representatives from each of the affected Operating Administrations to develop an implementation strategy to establish the recommended institutional capacity to coordinate hazardous materials programs in the Department. The HMPE team and the policy

representatives met on February 4 and 7, 2000, to discuss various organizational locations and structures for the institutional capacity.

On March 16th, the HMPE team met with the Senior Leadership Team to report on a proposal to implement an institutional capacity developed by the combined HMPE and policy team on February 4th and 7th. A unanimous decision was reached by the Senior Leadership Team to place this capacity in the Office of Intermodalism under the Associate Deputy Secretary. It was also agreed during this meeting that DOT should begin drafting Secretarial delegations to place the additional necessary responsibilities and authorities under the Associate Deputy Secretary. On March 16th, the HMPE Sponsors tasked RSPA's Office of the Chief Counsel to work with the Department's Assistant General Counsel for Regulation and Enforcement to start drafting appropriate delegations. The draft delegations are expected to be completed shortly and coordinated within DOT.

Once the institutional capacity is in place and staffed, its first task will be to oversee implementation all of the recommendations in the report related to coordination, program delivery, and data and oversee the areas identified for further analysis. DOT's Senior Leadership Team also supported the recommendation that the Operating Administrations and the Bureau of Transportation Statistics work together to improve specific program delivery and data issues following issuance of the report.

Chapter 9

AREAS FOR FURTHER ANALYSIS

During the program evaluation, the HMPE team identified a number of issues that merit a more detailed examination by DOT. The issues were too complex and time-consuming for this program evaluation. However, the team believes the Department should task the new institutional capacity with coordinating the development of these issues.

Area 1: DOT should gain a better understanding of undeclared shipments and their impact on transportation safety.

DOT should gain a better understanding of the nature of shipper and carrier practices related to undeclared shipments, explore methods for estimating the volume, types, and frequency of undeclared shipments, and develop appropriate targeting strategies and safeguards to address the problem. The shipping and transportation of undeclared or "hidden shipments" of hazardous materials is one of the most dangerous practices in transportation. DOT has proposed legislation to reauthorize its hazardous materials transportation safety program, one element of which is to enhance DOT's enforcement authority to open and examine packages DOT inspectors have reason to believe contain hazardous materials.

The Operating Administrations, primarily FAA, have data on a number of incidents related to undeclared shipments of hazardous materials. Since 1993, the majority of FAA's enforcement cases have involved undeclared hazardous materials. FAA is experiencing incidents caused by passengers packing prohibited hazardous materials, such as pesticides and micro-torches, in stowed luggage or materials carried on board. The National Transportation Safety Board found that improperly packaged and undeclared hazardous materials caused the loss of 110 lives on ValuJet flight 592 in the Florida Everglades on May 11, 1996. But the ValuJet incident is not the sole example. The section-by-section analysis accompanying DOT's proposed legislation provides additional examples of undeclared shipments.

The problem of undeclared shipments is not limited to air transportation; it has been experienced in virtually every mode of transportation. The RSPA's HMIS indicates that there were hundreds of carrier-reported incidents (usually releases of hazardous materials) involving undeclared or hidden hazardous materials. Specifically, from January 1990 through July 1998, there were approximately 1,887 carrier-reported incidents involving a release of undeclared hazardous

materials and resulting in 110 deaths and 175 injuries.[57] Because many releases are not reported, including those in intrastate highway transportation that were only required to be reported beginning in FY 1999, these statistics understate the severity of the problems caused by shipments of undeclared hazardous materials.

In addition, these statistics cover only those shipments in which a release occurred that drew attention to the undeclared material. There is a concern by hazardous materials inspectors and the team that these shipments represent only a small percentage of the total number of undeclared or hidden hazardous materials shipments. An element of the examination should also analyze the legal and logistical obstacles that prohibit generalized (where no indication of hazardous materials are evident) search and screening of passenger baggage and cargo to find hazardous materials, especially when the item is offered for transportation by air.

Area 2: DOT should examine ways to clarify and improve the HMR.

DOT needs to better understand the extent to which the HMR may be improved to optimize compliance and hazardous materials safety and then take appropriate action. Based on information developed during three focus group meetings conducted by the HMPE team, as well as written comments provided by industry, the complexity of the regulations is one of the primary reasons for noncompliance with the HMR.

During the July 22, 1999, focus group meeting, panelists and interested parties in the audience expressed concern that the regulations were too complicated, frequently inconsistent, and unclear. One theme that developed during the meeting was that there were too many regulatory exceptions to the requirements contained in the HMR.

Others attending the meeting noted that it was difficult for infrequent or one-time shippers to understand the regulations, and that many of the processes in the regulations defy logic. For example, the numbering process related to the hazard classes, such as class 1 for explosives, and class 8 for corrosives, does not appear to have any significance, while the order of the packing group numbers (1, 2 and 3) does have meaning related to the degree of hazard posed by the material. For example, 1 equates to a higher risk than 2 or 3. As a result, it is difficult for an infrequent or new user to determine what scale is being used by DOT to highlight risk. That is, is a 1 always high risk and a 3 or 9 lower risk?

A drum manufacturer gave another reason he believed attempting to comply with the regulations was a nightmare. He said his company had over 300 separate sets

[57] All 110 deaths were the result of the ValuJet incident in 1996.

of drum styles, but it was unclear how frequently the individual drums or styles needed to be tested or retested. The Department should undertake an examination to identify compliance problems due to the complexity of the HMR and determine whether the regulations can be simplified and clarified to improve compliance.

Consumer commodities/other regulated materials is another example in which the HMR may be ineffective or confusing. The HMR defines a consumer commodity as a material that is packaged and distributed in a form intended or suitable for sale through retail sales agencies or instrumentalities.[58] The problem with this definition (combined with the exceptions in the HMR) is that almost any material, even otherwise prohibited materials, may be reclassified as a consumer commodity and find its way aboard a passenger-carrying mode of transportation.

Butane, for example, is forbidden aboard passenger-carrying aircraft. However, the HMR allow for a packaging exception whereby the material can be packaged in limited quantities consisting of 4 ounces or less, then reclassified as a consumer commodity and loaded aboard a passenger aircraft. As a result of this reclassification, an airline operating a passenger aircraft could load its entire cargo space with this product and still be in technical compliance with the requirements of the HMR, but safety could be compromised. The NTSB has actively investigated some of these incidents and issued a safety recommendation to RSPA and FAA calling for additional regulatory requirements.

Area 3: DOT should review the adequacy of the Performance Oriented Packaging (POP) Standards to determine whether the regulations are improving safety as intended.

In 1990, RSPA issued the final rule on POP Standards, which substantially revised most packaging requirements for hazardous materials and aligned them with the United Nations Recommendations on the Transport of Dangerous Goods. The "new" performance-oriented or POP Standards eliminated numerous specification standards and was intended to allow shippers flexibility in the design and selection of most packages, while ensuring that the strength of the package is appropriate for the degree of hazards posed by the material it contains. This requirement, which became effective in October 1996 and was adopted internationally, is the current standard used by package manufacturers for most hazardous materials packaging. In order to test packagings against POP Standards, RSPA has contracted with a testing facility at the U.S. Army Materiel Command Logistics Support Activity, Packaging, Storage and Containerization Center located in Tobyhanna, Pennsylvania.

[58] 49 CFR Subpart 171.8

According to DOT's HMIS, package failures are the cause of roughly 11 to 15 percent of all hazardous materials incidents during any given year. The HMPE team's independent analysis of over 13,000 incident reports (DOT Form 5800.1) for 1996 found that approximately 35 percent of those incidents reported to RSPA should have been attributed to package failure instead of the 15 percent determined by RSPA's HMIS analysis.

If package failures are a frequent cause of incidents, then the effectiveness of the POP Standards or the desire of package manufacturers to comply with the standards may be called into question. During focus group meetings held by the HMPE team, industry personnel admitted that metal drums might be becoming more marginal since POP requirements have been in place. A number of parties indicated that the thickness of drum walls is thinner because there is no puncture test requirement. The problem with thinner wall drums was also discussed during our interview of a RSPA manager who stated that airlines are experiencing increased levels of package failure from drum punctures.

Both the Spanish and Italian Governments have provided working papers to the United Nations Committee of Experts on the Transport of Dangerous Goods. The papers indicate a "gradual reduction" in the performance of packages, specifically in air transport. DOT should determine whether the various POP Standards provide an adequate level of packaging safety.

Area 4: DOT should work with the United States Postal Service to identify and resolve any potential safety gaps related to hazardous materials shipments in the U.S. mail.

DOT does not have authority to inspect the U.S. mail (including parcels) placed in transportation and, without adequate safeguards, the public is placed at risk. For example, approximately 20 percent of cargo aboard passenger-carrying aircraft consists of U.S. mail. Although the United States Postal Service (USPS) requires such shipments to comply with the HMR, active regulatory inspection and enforcement of such shipments by USPS inspectors does not occur. This may represent a significant problem, especially when hazardous materials shipments are improperly prepared or undeclared. The frequency of hazardous materials incidents occurring in the mail is unknown by the Department since USPS maintains its own incident reporting system. DOT needs to work more closely with the USPS to determine the magnitude of hazardous materials incidents occurring in the U.S. mail, identify any safety gaps, and develop strategies to improve safety.

Area 5: DOT's Hazardous Materials Inspection and Compliance Authority Needs To Be Examined.

The HMTL does not clearly define the circumstances under which DOT may open packages suspected to be in noncompliance or thought to contain hidden or undeclared hazardous materials. Unlike other DOT-enforced safety statutes, the HMTL does not authorize DOT to issue emergency orders to address imminent hazards. Clarifying and expanding the inspection and enforcement authorities through the proposed Hazardous Materials Reauthorization Act, submitted by DOT to the Congress in February 1999, would improve the effectiveness of hazardous materials inspection and compliance actions, as well as the overall hazardous materials program. DOT should continue its efforts to strengthen the inspection and enforcement authorities of DOT inspectors.

Area 6: DOT Needs to Develop More Effective Performance Measures for the Hazardous Materials Program.

The goal for hazardous materials contained in the Department's Performance Plan for Fiscal Year 2000 is to reduce the number of serious hazardous materials incidents in transportation from a peak of 464 in 1996 to 411 or fewer in 2000. However, the Department's hazardous materials program will have little or no direct impact on this goal because the cause of most serious hazardous materials incidents is outside the scope of activities affected by the HMR. Any candidate measure used to assess the effectiveness of the hazardous materials program should address activities and outcomes over which the HMR have influence.

SELECTED PORTIONS OF TITLE 49 – UNITED STATES CODE TRANSPORTATION SUBTITLE III GENERAL AND INTERMODAL PROGRAMS CHAPTER 51 - TRANSPORTATION OF HAZARDOUS MATERIAL

Sec. 5101. Purpose

The purpose of this chapter is to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce by improving the regulatory and enforcement authority of the Secretary of Transportation.

Sec. 5102. Definitions

In this chapter -
(1) "commerce" means trade or transportation in the jurisdiction of the United States - (A) between a place in a State and a place outside of the State; or (B) that affects trade or transportation between a place in a State and a place outside of the State.

(2) "hazardous material" means a substance or material the Secretary of Transportation designates under section 5103(a) of this title.

(3) "hazmat employee" - (A) means an individual - (i) employed by a hazmat employer; and (ii) who during the course of employment directly affects hazardous material transportation safety as the Secretary decides by regulation; (B) includes an owner-operator of a motor vehicle transporting hazardous material in commerce; and (C) includes an individual, employed by a hazmat employer, who during the course of employment - (i) loads, unloads, or handles hazardous material; (ii) manufactures, reconditions, or tests containers, drums, and packagings represented as qualified for use in transporting hazardous material; (iii) prepares hazardous material for transportation; (iv) is responsible for the safety of transporting hazardous material; or (v) operates a vehicle used to transport hazardous material.

(4) "hazmat employer" - (A) means a person using at least one employee of that person in connection with - (i) transporting hazardous material in commerce; (ii) causing hazardous material to be transported in commerce; or (iii) manufacturing, reconditioning, or testing containers, drums, and packagings represented as qualified for use in transporting hazardous material; (B) includes an owner-operator of a motor vehicle transporting hazardous material in commerce; and (C) includes a department, agency, or instrumentality of the United States Government, or an authority of a State, political

subdivision of a State, or Indian tribe, carrying out an activity described in subclause (A)(i), (ii), or (iii) of this clause (4).

(5) "imminent hazard" means the existence of a condition that presents a substantial likelihood that death, serious illness, severe personal injury, or a substantial endangerment to health, property, or the environment may occur before the reasonably foreseeable completion date of a formal proceeding begun to lessen the risk of that death, illness, injury, or endangerment.

(6) "Indian tribe" has the same meaning given that term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(7) "motor carrier" means a motor carrier, motor private carrier, and freight forwarder as those terms are defined in section 13102 of this title.

(8) "national response team" means the national response team established under the national contingency plan established under section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9605).

(9) "person" in addition to its meaning under section 1 of title 1 - (A) includes a government, Indian tribe, or authority of a government or tribe offering hazardous material for transportation in commerce or transporting hazardous material to further a commercial enterprise; but (B) does not include - (i) the United States Postal Service; and (ii) in sections 5123 and 5124 of this title, a department, agency, or instrumentality of the Government.

(10) "public sector employee" - (A) means an individual employed by a State, political subdivision of a State, or Indian tribe and who during the course of employment has responsibilities related to responding to an accident or incident involving the transportation of hazardous material; (B) includes an individual employed by a State, political subdivision of a State, or Indian tribe as a firefighter or law enforcement officer; and (C) includes an individual who volunteers to serve as a firefighter for a State, political subdivision of a State, or Indian tribe.

(11) "State" means - (A) except in section 5119 of this title, a State of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and any other territory or possession of the United States designated by the Secretary; and (B) in section 5119 of this title, a State of the United States and the District of Columbia.

(12) "transports" or "transportation" means the movement of property and loading, unloading, or storage incidental to the movement.

(13) "United States" means all of the States.

Sec. 5103. General regulatory authority

(a) Designating Material as Hazardous. - The Secretary of Transportation shall designate material (including an explosive, radioactive material, etiologic agent, flammable or combustible liquid or solid, poison, oxidizing or corrosive material, and compressed gas) or a group or class of material as hazardous when the Secretary decides that transporting the material in commerce in a particular amount and form may pose an unreasonable risk to health and safety or property.

(b) Regulations for Safe Transportation. - (1) The Secretary shall prescribe regulations for the safe transportation of hazardous material in intrastate, interstate, and foreign commerce. The regulations - (A) apply to a person - (i) transporting hazardous material in commerce; (ii) causing hazardous material to be transported in commerce; or (iii) manufacturing, fabricating, marking, maintaining, reconditioning, repairing, or testing a packaging or a container that is represented, marked, certified, or sold by that person as qualified for use in transporting hazardous material in commerce; and (B) shall govern safety aspects of the transportation of hazardous material the Secretary considers appropriate. (2) A proceeding to prescribe the regulations must be conducted under section 553 of title 5, including an opportunity for informal oral presentation.

Sec. 5121. Administration

(a) General Authority. - To carry out this chapter, the Secretary of Transportation may investigate, make reports, issue subpoenas, conduct hearings, require the production of records and property, take depositions, and conduct research, development, demonstration, and training activities. After notice and an opportunity for a hearing, the Secretary may issue an order requiring compliance with this chapter or a regulation prescribed under this chapter.

(b) Records, Reports, and Information. - A person subject to this chapter shall - (1) maintain records, make reports, and provide information the Secretary by regulation or order requires; and (2) make the records, reports, and information available when the Secretary requests.

(c) Inspection. - (1) The Secretary may authorize an officer, employee, or agent to inspect, at a reasonable time and in a reasonable way, records and property related to - (A) manufacturing, fabricating, marking, maintaining, reconditioning, repairing, testing, or distributing a packaging or a container for use by a person in transporting hazardous material in commerce; or (B) the transportation of hazardous material in commerce.

(2) An officer, employee, or agent under this subsection shall display proper credentials when requested.

(d) Facility, Staff, and Reporting System on Risks, Emergencies, and Actions. - (1) The Secretary shall - (A) maintain a facility and technical staff sufficient to provide, within the United States Government, the capability of evaluating a risk related to the transportation of hazardous material and material alleged to be hazardous; (B) maintain a central reporting system and information center capable of providing information and advice to law enforcement and firefighting personnel, other interested individuals, and officers and employees of the Government and State and local governments on meeting an emergency related to the transportation of hazardous material; and (C) conduct a continuous review on all aspects of transporting hazardous material to decide on and take appropriate actions to ensure safe transportation of hazardous material. (2) Paragraph (1) of this subsection does not prevent the Secretary from making a contract with a private entity for use of a supplemental reporting system and information center operated and maintained by the contractor.

(e) Report. - The Secretary shall, once every 2 years, prepare and submit to the President for transmittal to the Congress a comprehensive report on the transportation of hazardous materials during the preceding 2 calendar years. The report shall include - (1) a statistical compilation of accidents and casualties related to the transportation of hazardous material; (2) a list and summary of applicable Government regulations, criteria, orders, and exemptions; (3) a summary of the basis for each exemption; (4) an evaluation of the effectiveness of enforcement activities and the degree of voluntary compliance with regulations; (5) a summary of outstanding problems in carrying out this chapter in order of priority; and (6) recommendations for appropriate legislation.

Sec. 5123. Civil Penalty

(a) Penalty. - (1) A person that knowingly violates this chapter or a regulation prescribed or order issued under this chapter is liable to the United States Government for a civil penalty of at least $250 but not more than $25,000 for each violation. A person acts knowingly when - (A) the person has actual knowledge of the facts giving rise to the violation; or (B) a reasonable person acting in the circumstances and exercising reasonable care would have that knowledge. (2) A separate violation occurs for each day the violation, committed by a person that transports or causes to be transported hazardous material, continues.

(b) Hearing Requirement. - The Secretary of Transportation may find that a person has violated this chapter or a regulation prescribed under this chapter only after notice and an opportunity for a hearing. The Secretary shall impose a penalty under this section by giving the person written notice of the amount of the penalty.

(c) Penalty Considerations. - In determining the amount of a civil penalty under this section, the Secretary shall consider - (1) the nature, circumstances, extent, and gravity of the violation; (2) with respect to the violator, the degree of culpability, any history of prior violations, the ability to pay, and any effect on the ability to continue to do business; and (3) other matters that justice requires.

(d) Civil Actions To Collect. - The Attorney General may bring a civil action in an appropriate district court of the United States to collect a civil penalty under this section.

(e) Compromise. - The Secretary may compromise the amount of a civil penalty imposed under this section before referral to the Attorney General.

(f) Setoff. - The Government may deduct the amount of a civil penalty imposed or compromised under this section from amounts it owes the person liable for the penalty.

(g) Depositing Amounts Collected. - Amounts collected under this section shall be deposited in the Treasury as miscellaneous receipts.

Sec. 5124. Criminal Penalty

A person knowingly violating section 5104(b) of this title or willfully violating this chapter or a regulation prescribed or order issued under this chapter shall be fined under title 18, imprisoned for not more than 5 years, or both.

Sec. 5125. Preemption

(a) General. - Except as provided in subsections (b), (c), and (e) of this section and unless authorized by another law of the United States, a requirement of a State, political subdivision of a State, or Indian tribe is preempted if - (1) complying with a requirement of the State, political subdivision, or tribe and a requirement of this chapter or a regulation prescribed under this chapter is not possible; or (2) the requirement of the State, political subdivision, or tribe, as applied or enforced, is an obstacle to accomplishing and carrying out this chapter or a regulation prescribed under this chapter.

(b) Substantive Differences. - (1) Except as provided in subsection (c) of this section and unless authorized by another law of the United States, a law, regulation, order, or other requirement of a State, political subdivision of a State, or Indian tribe about any of the following subjects, that is not substantively the same as a provision of this chapter or a regulation prescribed under this chapter, is preempted: (A) the designation, description, and classification of hazardous material. (B) the packing, repacking, handling, labeling, marking, and placarding of hazardous material. (C) the preparation, execution, and use of shipping documents related to hazardous material and requirements related to the number, contents, and placement of those documents. (D) the written notification,

recording, and reporting of the unintentional release in transportation of hazardous material. (E) the design, manufacturing, fabricating, marking, maintenance, reconditioning, repairing, or testing of a packaging or a container represented, marked, certified, or sold as qualified for use in transporting hazardous material. (2) If the Secretary of Transportation prescribes or has prescribed under section 5103(b), 5104, 5110, or 5112 of this title or prior comparable provision of law a regulation or standard related to a subject referred to in paragraph (1) of this subsection, a State, political subdivision of a State, or Indian tribe may prescribe, issue, maintain, and enforce only a law, regulation, standard, or order about the subject that is substantively the same as a provision of this chapter or a regulation prescribed or order issued under this chapter. The Secretary shall decide on and publish in the Federal Register the effective date of section 5103(b) of this title for any regulation or standard about any of those subjects that the Secretary prescribes after November 16, 1990. However, the effective date may not be earlier than 90 days after the Secretary prescribes the regulation or standard nor later than the last day of the 2-year period beginning on the date the Secretary prescribes the regulation or standard. (3) If a State, political subdivision of a State, or Indian tribe imposes a fine or penalty the Secretary decides is appropriate for a violation related to a subject referred to in paragraph (1) of this subsection, an additional fine or penalty may not be imposed by any other authority.

(c) Compliance With Section 5112(b) Regulations. - (1) Except as provided in paragraph (2) of this subsection, after the last day of the 2-year period beginning on the date a regulation is prescribed under section 5112(b) of this title, a State or Indian tribe may establish, maintain, or enforce a highway routing designation over which hazardous material may or may not be transported by motor vehicles, or a limitation or requirement related to highway routing, only if the designation, limitation, or requirement complies with section 5112(b). (2)(A) A highway routing designation, limitation, or requirement established before the date a regulation is prescribed under section 5112(b) of this title does not have to comply with section 5112(b)(1)(B), (C), and (F). (B) This subsection and section 5112 of this title do not require a State or Indian tribe to comply with section 5112(b)(1)(I) if the highway routing designation, limitation, or requirement was established before November 16, 1990. (C) The Secretary may allow a highway routing designation, limitation, or requirement to continue in effect until a dispute related to the designation, limitation, or requirement is resolved under section 5112(d) of this title.

(d) Decisions on Preemption. - (1) A person (including a State, political subdivision of a State, or Indian tribe) directly affected by a requirement of a State, political subdivision, or tribe may apply to the Secretary, as provided by regulations prescribed by the Secretary, for a decision on whether the requirement is preempted by subsection (a), (b)(1), or (c) of this section. The Secretary shall publish notice of the application in the Federal Register. The Secretary shall issue a decision on an application for a determination within 180 days after the date of the publication of the notice of having received such application, or the Secretary shall publish a statement in the Federal

Register of the reason why the Secretary's decision on the application is delayed, along with an estimate of the additional time necessary before the decision is made. After notice is published, an applicant may not seek judicial relief on the same or substantially the same issue until the Secretary takes final action on the application or until 180 days after the application is filed, whichever occurs first. (2) After consulting with States, political subdivisions of States, and Indian tribes, the Secretary shall prescribe regulations for carrying out paragraph (1) of this subsection. (3) Subsection (a) of this section does not prevent a State, political subdivision of a State, or Indian tribe, or another person directly affected by a requirement, from seeking a decision on preemption from a court of competent jurisdiction instead of applying to the Secretary under paragraph (1) of this subsection.

(e) Waiver of Preemption. - A State, political subdivision of a State, or Indian tribe may apply to the Secretary for a waiver of preemption of a requirement the State, political subdivision, or tribe acknowledges is preempted by subsection (a), (b)(1), or (c) of this section. Under a procedure the Secretary prescribes by regulation, the Secretary may waive preemption on deciding the requirement - (1) provides the public at least as much protection as do requirements of this chapter and regulations prescribed under this chapter; and (2) is not an unreasonable burden on commerce.

(f) Judicial Review. - A party to a proceeding under subsection (d) or (e) of this section may bring a civil action in an appropriate district court of the United States for judicial review of the decision of the Secretary not later than 60 days after the decision becomes final.

(g) Fees. - (1) A State, political subdivision of a State, or Indian tribe may impose a fee related to transporting hazardous material only if the fee is fair and used for a purpose related to transporting hazardous material, including enforcement and planning, developing, and maintaining a capability for emergency response. (2) A State or political subdivision thereof or Indian tribe that levies a fee in connection with the transportation of hazardous materials shall, upon the Secretary's request, report to the Secretary on - (A) the basis on which the fee is levied upon persons involved in such transportation; (B) the purposes for which the revenues from the fee are used; (C) the annual total amount of the revenues collected from the fee; and (D) such other matters as the Secretary requests.

HAZARDOUS MATERIALS-RELATED SECRETARIAL DELEGATIONS TO DOT AGENCIES

The Secretary of Transportation has delegated Hazardous Materials Transportation Law responsibilities to the Operating Administrations in DOT. DOT's current delegations of authority, with the exception of the Federal Motor Carrier Safety Administration (FMCSA) delegations, do NOT reflect the 1994 codification of Title 49 of the United States Code or other statutory changes over the past several years. The delegations have not been updated by DOT's Office of General Counsel.

A brief description of the delegations of authority is listed below. The actual delegations, as set forth in the Code of Federal Regulations, follow.

The *Coast Guard* is delegated inspection and enforcement authority with respect to packaged and bulk hazardous materials transportation by water and the authority to issue the regulations and exemptions governing the bulk transportation of hazardous materials in the marine mode.

FAA is delegated inspection and enforcement authority with respect to hazardous materials transportation by air and to air-mode-specific bulk packagings; authority to carry out the Federal Aviation Act provisions as they relate to the transportation of such materials by air; and authority to devise and carry out procedures for monitoring and enforcing provisions of regulations with respect to the transportation of radioactive materials on passenger-carrying aircraft.

FRA is delegated inspection and enforcement authority with respect to transportation or shipment of hazardous materials by railroad, including the manufacture, fabrication, marking, maintenance, reconditioning, repair or testing of containers which are represented, marked, certified, or sold for use in the bulk transportation of hazardous materials by railroad.

FMCSA is delegated inspection and enforcement authority with respect to transportation or shipment of hazardous materials by highway, including the manufacture, fabrication, marking, maintenance, reconditioning, repair, or test of containers which are represented, marked, certified, or sold for use in the bulk transportation of hazardous materials by highway. FMCSA is also responsible for issuing regulations governing the routing of hazardous materials in the highway mode.

RSPA is delegated authority to issue the hazardous materials regulations; issue exemptions from requirements of the law or hazardous materials regulations; issue emergency response planning and training grants to States and American Indian tribes; and require registration and payment of fees by certain shippers and carriers. In addition, RSPA has inspection and enforcement authority concerning any regulatory exemption or approval; administering the requirements for telephonic or written report of a hazardous material incident; formulating packaging requirements (except modal-specific bulk packaging requirements); and setting any requirements related to shippers of hazardous materials for transportation (except those offering a hazardous material in a modal-specific bulk packaging).

RSPA's regulatory hazardous materials functions are more extensive than the other four Operating Administrations. Under the HMTL, RSPA issues the Hazardous Materials Regulations (HMR). Except for FMCSA's authority to establish highway routing, RSPA is solely responsible for: issuing rules and regulations governing the safe transportation of packaged hazardous materials; issuing, renewing, modifying and terminating exemptions and approvals; and making administrative determinations of whether state, local, or Indian tribe requirements (1) are preempted by the HMTL, or (2) may remain in effect under a waiver of preemption. RSPA also develops the national regulatory program for hazardous materials transportation for all of the modes.

RSPA's regulation development process involves the use of data, information, and experience to assess the risk hazardous materials present in transportation. RSPA develops the HMR based on the actual and perceived risks of commodities, transportation data/trends (including incidents/accidents) and actual transportation experience. The HMR cover five primary areas:

- Hazardous materials definition/classification;
- Hazard communication (e.g., shipping papers, marking, labeling, and placarding);
- Packaging requirements;
- Operational rules; and
- Training.

The HMR provide a uniform set of requirements for hazardous materials transportation that apply to the transportation of hazardous materials in intrastate, interstate, and foreign commerce by aircraft, railcar, vessel and motor vehicle. They also generally facilitate foreign trade by being compatible with international hazardous materials transportation regulatory requirements.

International Standards

RSPA and affected modal administrations represent DOT in international organizations, working to assure the compatibility of domestic regulations with the regulations of international bodies. For example, the Coast Guard together with RSPA work closely with the International Maritime Organization and the FAA and RSPA work with the International Civil Aviation Organization. RSPA also represent DOT in the United Nations Economic Commission for Europe and Economic and Social Council, and the International Atomic Energy Agency.

International standards and agreements also affect U.S. regulations governing hazardous materials transportation. For example, the Non-bulk Performance-oriented Packaging Standards[1] are based on the United Nations Recommendations on the Transport of Dangerous Goods. Any change to the international standards affects transportation of hazardous materials in the United States. International standards and agreements that affect U.S. regulations include:

- United Nations Recommendations on the Transport of Dangerous Goods;
- International Maritime Organization's International Maritime Dangerous Goods Code;
- International Civil Aviation Organization's Technical Instructions on the Transport of Dangerous Goods by Air;
- International Atomic Energy Agency's Regulations on the Safe Transportation of Radioactive Materials; and
- Safety of Life at Sea Convention.

[1] 49 CFR Subpart 178.500

TITLE 49--TRANSPORTATION Subtitle A--Office of the Secretary of Transportation PART 1—

ORGANIZATION AND DELEGATION OF POWERS AND DUTIES—

Sec. 1.46 Delegations to Commandant of the Coast Guard

The Commandant of the Coast Guard is delegated authority to:

* * * * *

(f) Administer Executive Order 11459 (34 FR 5057), relating to approval of containers for transport under Customs seal.

* * * * *

(l) Carry out the functions vested in the Secretary by sections 104(i), 104(j), 311(b), 311(j) (2) and (3), 311(m)(2), 312, and 402(b)(6) of the Federal Water Pollution Control Act (33 U.S.C. 1321), as amended by the Oil Pollution Act of 1990 (August 18, 1990; Pub L. 101-380; 104 Stat. 484), and sections 4202(b) (2) and (3) of the Oil Pollution Act of 1990.

(m) Carry out the functions assigned to the Secretary by Executive Order 12777 (3 CFR, 1991 Comp.; 56 FR 54757) in sections 1(b), 2(a), 2(b)(2), 2(c), 2(d)(2), 2(e)(2), 2(f), 2(g)(2), 3, 5(a)(2), 5(b)(1) and (3), 6, 7(a) (1) and (3), 7(b), 7(c), 7(d), 8(d), 8(f), 8(g), 8(h), 9, and 10(c), excepting that portion of section 2(b)(2) relating to the establishment of procedures, methods, and equipment and other requirements for equipment to prevent and to contain discharges of oil and hazardous substances from pipelines, motor carriers, and railroads; and further excepting the exercise of the authority in section 2(d)(2) over motor carriers and railroads, other than for operations incident to the transfer of oil or hazardous substances to or from vessels, and the exercise of the authority in section 2(d)(2) over pipelines.

(n) * * * (4) Port and Tanker Safety Act of 1978 (92 Stat. 1471), except sections 4, 5, 6, 7, 8, 12 and 13 of Sec. 2 to the extent that those sections pertain to the operation of the St. Lawrence Seaway;

* * * * *

(t) Carry out the functions vested in the Secretary by 49 App. U.S.C. 1801-1819, and 46 App. U.S.C. 3306(a)(5) to the extent they relate to

regulations and exemptions governing the bulk transportation of hazardous materials that are loaded or carried on board a vessel without benefit of containers or labels, and received and handled by the vessel carrier without mark or count, and regulations and exemptions governing ships' stores and supplies.

(u) Carry out the functions vested in the Secretary by 49 U.S.C. 1808(a), (b), and (c) and 1809 and 1810, relating to investigations, records, inspections, penalties, and specific relief, so far as they apply to the transportation or shipment of hazardous materials by water.

* * * * *

(y) Carry out the functions and responsibilities vested in the Secretary by the Natural Gas Pipeline Safety Act of 1968, as amended (49 U.S.C. 1671 et seq.) relating to rulemaking so far as it applies to liquefied natural gas facilities adjacent to the navigable waters of the United States: Provided, that such rulemaking is in accordance with the Memorandum of Understanding between the Coast Guard and Materials Transportation Bureau executed on February 7, 1978, for regulation of such facilities.

Sec. 1.47 Delegations to Federal Aviation Administrator

The Federal Aviation Administrator is delegated authority to:

(a) Carry out the powers and duties transferred to the Secretary of Transportation by, or subsequently vested in the Secretary by virtue of, section 6(c)(1) of the Department of Transportation Act (49 U.S.C. 1655(c)(1)), including those pertaining to aviation safety (except those related to transportation, packaging, marking, or description of hazardous materials) and vested in the Secretary by section 308(b) of title 49 U.S.C. and sections 306-309, 312-314, 1101, 1105, and 1111 and titles VI, VII, IX (excluding section 902(h)), and XII of the Federal Aviation Act of 1958, as amended.

* * * * *

(i) Carry out the functions vested in the Secretary by section 902(h)(2) of the Federal Aviation Act of 1958, as amended, as it relates to enforcement of hazardous materials regulations as they apply to the transportation or shipment of such materials by air.

(j) Carry out the functions vested in the Secretary by 49 U.S.C. 1807 as it relates to the establishment of procedures for monitoring and enforcing provisions of regulations with respect to the transportation of radioactive materials on passenger-carrying aircraft.

(k) Carry out the functions vested in the Secretary by 49 App. U.S.C. 1808 (a), (b), and (c), 1809 and 1810 relating to investigations, records, inspections, penalties and specific relief so far as they apply to the transportation or shipment of hazardous materials by air, including the manufacture, fabrication, marking, maintenance, reconditioning, repair, or test of containers which are represented, marked, certified, or sold for use in the bulk transportation of hazardous materials by air.

* * * * *

(m) Carry out the functions vested in the Secretary by sections 4(a) and 5(c) of Executive Order 12316 of August 14, 1981 (46 FR 42237, Aug. 20, 1981) (delegating sections 107(c)(1)(c) and 108(b), respectively, of the Comprehensive Environmental Response, Compensation, and Liability Act of 1981, Pub. L. 96-510), insofar as they relate to aircraft.

(n) Carry out the functions vested in the Secretary by section 3(d) of the Act to Prevent Pollution from Ships (33 U.S.C. 1902(d)) as it relates to ships owned or operated by the Federal Aviation Administration when engaged in noncommercial service.

* * * * *

(u) Carry out the functions assigned to the Secretary by Executive Order 12465 (February 24, 1984) (3 CFR, 1984 Comp., p. 163) relating to commercial expendable launch vehicle activities.

Sec. 1.49 Delegations to Federal Railroad Administrator

The Federal Railroad Administrator is delegated authority to:

(s)(1) Carry out the functions vested in the Secretary by 49 App. U.S.C. 1808 (a), (b), and (c), 1809, and 1810 relating to investigations, records, inspections, penalties, and specific relief so far as they apply to the transportation or shipment of hazardous materials by railroad, including the manufacture, fabrication, marking, maintenance, reconditioning, repair or test of containers which are represented, marked, certified, or sold for use in the

bulk transportation of hazardous materials by railroad. (2) Carry out the functions vested in the Secretary by 49 App. U.S.C. 1813 (a) and (b); and 1817.

* * * * *

(ee) Carry out the functions vested in the Secretary by sections 9, 10, 11, 12, and 13 of the Sanitary Food Transportation Act of 1990 (Pub. L. 101-500; 104 Stat. 1213), with respect to transportation by railroad.

* * * * *

(gg) Carry out the functions vested in the Secretary by sections 16 and 21 of the Hazardous Materials Transportation Uniform Safety Act of 1990 (Pub. L. 101-615; 104 Stat. 3244 (49 App. U.S.C. 1813 note and 1817 note)).

(hh) Exercise the authority vested in the Secretary by Section 601 (d) and (e) of the National and Community Service Act of 1990 (45 U.S.C. 546 note) as it relates to the discharge of human waste from railroad passenger cars.

(ii) Carry out the functions and exercise the authority delegated to the Secretary in section 2(d)(2) of Executive Order 12777 (3 CFR, 1991 Comp.; 56 FR 54757), with respect to rail transportation, relating to the approval of means to ensure the availability of private personnel and equipment to remove, to the maximum extent practicable, a worst case discharge, the review and approval of response plans, and the authorization of railroads, subject to the Federal Water Pollution Control Act (33 U.S.C. 1321), to operate without approved response plans, except as delegated in Sec. 1.46(m).

Sec. 1.53 Delegations to the Administrator of the Research and Special Programs Administration.

The Administrator of the Research and Special Programs Administration is delegated authority to exercise powers and perform duties, including duties under the specified statutes as follows:

* * * * *

(b) Hazardous materials. (1) Sections 101-121 of the Hazardous Materials Transportation Act of 1975 (49 App. U.S.C. 1801-1819), as amended by the Hazardous Materials Transportation Uniform Safety Act of 1990 (104 Stat. 3244), except as delegated by Secs. 1.46(t), 1.47(j), 1.48(u)(2), and

1.49(s)(2), and except that the enforcement activities of the Research and Special Programs Administration (RSPA) shall be limited to any matter relating to or concerning any of the following:

(i) Any violation of an exemption or approval issued under that Act;

(ii) Any violation of any requirement for a telephonic or written report of a hazardous materials incident or any other reporting requirement imposed under that Act;

(iii) Any manufacture, fabrication, marking, maintenance, reconditioning, repair, testing, or retesting of any packaging, except modal-specific bulk packaging, which is represented, marked, certified, or sold for use in the transportation of hazardous materials, including any United Nations standard or DOT specification or exemption packaging;

(iv) Any manufacture, fabrication, marking, maintenance, reconditioning, repair, testing, or retesting of any modal-specific bulk packaging, which is represented, marked, certified, or sold for use in the transportation of hazardous materials, including any United Nations standard or DOT specification or exemption packaging, only when requested by the modal administration with primary responsibility for such activity;

(v) Any carrier of hazardous materials only when requested by the modal administration with primary responsibility for inspecting such carrier;

(vi) Any offeror of any hazardous material for transportation with respect to its offering of any hazardous material for transportation in: (A) Any modal-specific bulk packaging only when requested by the modal administration with primary responsibility for inspecting such packaging; or (B) Any other packaging.

This delegation to the Administrator of RSPA does not limit the enforcement authority of the Administrators of FHWA, FRA, and FAA, and the Commandant of the Coast Guard under the Hazardous Materials Transportation Act, as amended. Those agencies have enforcement authority over all aspects of the transportation or shipment of hazardous materials by their respective modes, including the manufacture, fabrication, marking, maintenance, reconditioning, repair, testing, or retesting of any bulk packaging intended or represented as intended for use in the transportation of hazardous materials by their respective modes.

(b)(2) * * * (4) Section 16, 25, 26, and 29 of the Hazardous Materials Transportation Uniform Safety Act of 1990 (Pub. L. 101-615; 104 Stat. 3244 (49 app. U.S.C. 1813 note, 1804 note; 29 U.S.C. 655 note)). (5)

Section 406 of the ICC Termination Act of 1995 (Public Law 104-88) relating to the issuance of regulations concerning the use of certain fiber drum packagings for the transportation of liquid hazardous materials, including contracting for a study by the National Academy of Sciences.

* * * * *

(d) Intermodal transport. (1) Section 4(e) of the International Safe Container Act (Pub. L. 95-208, 91 Stat. 1475).

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(j) Section 8 of the Independent Safety Board Act Amendments of 1990 (Pub. L. 101-641; 104 Stat. 4654 (49 app. U.S.C. 1804 note)).

(k)(1) Carry out the functions and exercise the authority delegated to the Secretary in Executive Order 12777 (3 CFR, 1991 Comp.; 56 FR 54757) in section 2(b)(2) relating to the establishment of procedures, methods, and equipment and other requirements for equipment to prevent discharges from, and to contain oil and hazardous substances in, pipelines, motor carriers, and railroads. (See 49 CFR 1.46 and 1.66.) (2) Carry out the functions and exercise the authority delegated to the Secretary in section 2(d)(2) of Executive Order 12777 (3 CFR, 1991 Comp.; 56 FR 54757) relating to the issuance of regulations requiring the owners or operators of pipelines, motor carriers, and railroads, subject to the Federal Water Pollution Control Act (33 U.S.C. 1321), to prepare and submit response plans, except as delegated in section 1.46(m).

* * * * *

(l) University Grants Program. Sections 11(b) and 11(c) of the Federal Transit Act, as amended, 49 U.S.C. App. 1607c(b) and 1607c(c), except for the provisions in sections 11(b)(8)(b) and 11(b)(10). [Amdt. 1-130, 43 FR 5516, Feb. 9, 1978]

Sec. 1.73 Delegations to Director, Office of Motor Carrier Safety

The Director of the Office of Motor Carrier Safety is delegated authority to:

* * * * *

(d)(1) Carry out the functions vested in the Secretary by 49 U.S.C. 5121(a), (b), and (c), 5122(a) and (b), 5123, and 5124, relating to investigations, records, inspections, penalties, and specific relief so far as they apply to the transportation or shipment of hazardous materials by highway, including the manufacture, fabrication, marking, maintenance, reconditioning, repair or test of containers which are represented, marked, certified, or sold for use in the bulk transportation of hazardous materials by highway.

(d)(2) Carry out the functions vested in the Secretary by 49 U.S.C. 5112 relating to highway routing of hazardous materials; 5109 relating to motor carrier safety permits, except subsection (f); 5125(a) and (c)-(f), relating to preemption determinations or waivers of preemption of hazardous materials highway routing requirements; 5105(e) relating to inspections of motor vehicles carrying hazardous material; 5119 relating to uniform forms and procedures; and 5127(f) and (g) relating to credits to appropriations and availability of amounts.

* * * * *

(h) Carry out the functions vested in the Secretary by 49 U.S.C. 5708 relating to food transportation inspections; 5710 relating to the Secretary's powers to administer the sanitary food transportation regulations; 5711 relating to enforcement of sanitary food transportation regulations and applicable penalties; 5712 and 5714 relating to federal-State relations; and 5113 and 31144 relating to safety fitness of owners and operators.

(i) Carry out the functions vested in the Secretary by 49 U.S.C. 5118 relating to the use of inspectors to promote safety in the highway transportation of radioactive material; and 49 U.S.C. 31142(f) relating to application of State regulations to government-leased vehicles and operators.

* * * * *

(k) Carry out the functions and exercise the authority delegated to the in section 2(d)(2) of Executive Order 12777 (3 CFR, 1992 Comp., p. 351), with respect to highway transportation, relating to the approval of means to

ensure the availability of private personnel and equipment to remove, to the maximum extent practicable, a worst case discharge, the review and approval of response plans, and the authorization of motor carriers, subject to the Federal Water Pollution Control Act (33 U.S.C. 1321), to operate without approved response plans, except as delegated in Sec. 1.46(m)

FEDERAL REGISTER NOTICE ANNOUNCING THREE FOCUS GROUP MEETINGS

ONE DOT
WORKING BETTER TOGETHER

INFORMATION: NOTIFICATION OF UPCOMING ACTIVITY-
Department-Wide Program Evaluation of the Hazardous Materials Transportation Programs

In the enclosed *Federal Register* notice, the Department of Transportation is announcing a series of three focus group meetings to discuss issues with interested parties concerning DOT's hazardous materials safety programs and to request comments from parties unable to attend the meetings.

This is to advise you about these upcoming meetings and provide you with an opportunity to participate either in person or through your written comments. Your support in this effort is greatly appreciated. If you have any questions, please contact Ms. Jackie Goff, 202-493-0326, or George Whitney, 202-366-4831, Co-Chairs, DOT-wide Program Evaluation of the Hazardous Materials Transportation Programs, or e-mail your comments to: 9.awa-dot-hmpe@faa.gov Thank you.

Enclosure

DEPARTMENT OF TRANSPORTATION

Office of the Secretary

Research and Special Programs Administration

Department-Wide Program Evaluation of the Hazardous Materials Transportation Program (HM Program Evaluation)

AGENCY: Office of Inspector General (OIG) and Research and Special Programs Administration (RSPA), DOT.
ACTON: Notice of meetings and request for comments.

SUMMARY: The Department of Transportation (DOI) is announcing a series of three HM Program Evaluation Focus Group Meetings to discuss issues with interested stakeholders concerning DOT's hazardous materials safety programs and to request comments form parties unable to attend the *series* of meetings. Each meeting will concentrate on a specific topic and likely involve six to ten members pre-selected from the hazardous materials community for each focus group. Other interested parties are invited to observe each meeting and will be given the opportunity to ask questions and raise issues. Focus Group Meeting #I will focus on the "Effectiveness and Adequacy of DOT's Hazardous Materials Regulatory Program." Focus Group Meeting #2 will focus on the "Effectiveness of DOT's Approach for Gaining Compliance." Focus Group Meeting #3 will focus on "Measuring DOT's Performance in Hazardous Materials Safety." This action is In support of the internal DOT-wide Program Evaluation of the Hazardous Materials Transportation Programs (HM Program Evaluation) which DOT announced in the **Federal Register** on March 9,1999. The HM Program Evaluation will document and assess the effectiveness of DOT's hazardous materials transportation safety programs in order to improve safety and environmental protection. Your participation in these HM Program Evaluation Focus Group Meetings and responses to the issues raised in this notice and during the meetings will assist DOT in identifying issues that the HM Program Evaluation team may address and evaluate as it continues Its efforts.

DATES. *Comment Date:* Comments must be received on or before August 27, 1999.

Public Meeting Dates: Public meetings will be held on *July* 22. 1999, August 11, 1999. and August 17. 1999. Meetings are scheduled from 9 a.m. to 4:00 p.m.

ADDRESSES: *Written Comments:* Address written comments to HM Program Evaluation Team, U.S. Department of Transportation. 400 Seventh Street, SW, Room 2438, Washington, DC 20590--Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard. You may also submit comments by e-mail at: -9.awa-dot-hmpe@faa.gov".

Public Meetings: The July 22, 1999 meeting will be held in Room 2230 of the DO * T Headquarters Building (Nassif Building) 400 Seventh Street, SW. Washington, DC 20590-0001. The August 11. 1999, meeting will be held in the Illinois/Minnesota Rooms of the

FAA Building, 2300 East Devon Avenue, Des Plaines, IL. The August 17, 1999, meeting will be held in Room 2230 of the DOT Headquarters Building (Nassif Building) 400 Seventh Street, SW, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT: Jackie A. Goff, 202-493-0326. or George Whitney, 202-366-4831, Co-Chairs, HM Program Evaluation Team, U.S. Department of Transportation; Room 2438. 400 Seventh Street SW, Washington, DC 20590-0001. For information on facilities or services for individuals with disabilities or to request special assistance at the meetings, contact Ms. Goff or Mr. Whitney. If you are unable to attend one or more of these meetings or wish to provide additional comments, we welcome your written responses no later than August 27, 1999. If you would like your comments considered during a specific meeting for which you will be unable to attend, your comments should be received by the team at least 5 working days prior to that specific meeting and sent to the DOT address provided above or e-mailed to: -9.awadot-hmpe@faa.gov".

I. Background

On March 9,1999, DOT published a Notice in the **Federal Register (64 FR 11528)** announcing the initiation of an internal Department-wide Program Evaluation of the Hazardous Materials Transportation Programs (HM Program Evaluation). In that Notice it was announced that the HM Program Evaluation team is staffed by 10 full-time persons, including at least one full-time person from the OIG and RSPA and each of the following Operating Administrations: The United States Coast Guard (USCG): the Federal Aviation Administration (FAA); The Federal Highway Administration (FHWA); and the Federal Railroad Administration (FRA).

The HM Program Evaluation team is examining the Federal hazardous materials transportation law, the program structure defined by the delegation of authority within DOT, and assessing program delivery. The HM Program Evaluation is intended to allow DOT to determine the effectiveness of the current hazardous material programs, including the division of responsibilities across and within modes, and the allocation of resources dedicated to specific functions. The HM Program Evaluation is also focusing on cross-modal issues and will include an analysis and critique of DOT's current program intervention tools including regulation, education, training,

outreach, inspection, and enforcement. This will position DOT to potentially increase safety and environmental protection when hazardous materials are in commerce.

The scope of the HM Program Evaluation is limited to those activities covered by 49 CFR Part 106 (Rulemaking Procedures), Part 107 (Hazardous Materials Program Procedures), and the Hazardous Materials Regulations (HMR), 49 CFR Parts 171-180. International shipments of hazardous materials are also included in the scope of the HM Program Evaluation to permit a review of the International Maritime Dangerous Goods Code (IMDG) and the International Civil Aviation Organization's Technical Instructions on the Transportation of Dangerous Goods by Air (ICAO), both of which are authorized by HMR as alternative standards for many of the requirements in the HMR for shipments destined for export or that are being imported. The team will be examining whether the current programs are achieving the stated purpose of the Federal hazardous materials transportation law.

11. **HM Program Evaluation Meetings and Issues**

DOT's intent is to use Information gathered during three focus group meetings to further develop issues for consideration by the HM Program Evaluation team. We anticipate that each focus group will consist of approximately six to ten pre-selected individuals from the hazardous materials community. To maximize the benefits of the focus groups, they will be comprised of individuals having expertise in hazardous materials transportation who are likely to be affected by the outcome of the HM Program Evaluation. Our aim Is that members of the focus groups will be representative of the community of shippers, carriers, packaging manufacturers, hazmat employees, enforcement personnel, emergency responders, trade associations. labor representatives and other interested parties involved with the transportation of hazardous materials. In addition to the focus group members, other interested parties are invited to observe at each focus group meeting. They will have an opportunity to raise issues and ask questions. The issues to be discussed during the three different focus groups are outlined below.

Focus Group Meeting # 1. *Washington, DC, July 22, 1999: "Effectiveness and Adequacy of DOT's Hazardous Materials Regulatory Program"*

Focus Group Meeting #1 will focus primarily on issues involving the effectiveness and adequacy of DOT's regulatory program. Rulemaking procedures for the hazardous materials program are in 49 CFR Part 106. These procedures address petitions for rulemaking, advance notices and notices of proposed rulemaking, final rules, interim final rules, and direct final rules. In addition to these procedural rules, the rulemaking process Is governed by a variety of statutes and Executive Orders. Procedures concerning exemptions to regulations are in 49 CFR Part 107. Exemptions authorize the regulated industry to perform functions that are not otherwise authorized by the Hazardous Materials Regulations. The regulatory scheme requires that the agency must rind that the exemption establishes a level of safety at least equal to that required by the regulation. If the regulations do not establish a level of safety. the agency must find that the exemption is consistent with the public interest.

In Focus Group Meeting #1, we are interested in determining how well DOT's hazardous materials regulatory system is minimizing risk. The hazardous materials regulatory system is designed to reduce the risks associated with the transport ation of hazardous material shipments. Reduction of risk is the major way in which DOT improves the overall level of safety in the transportation system. Questions related to this issue include:

* Based on your experiences with the regulatory system for hazardous materials (domestic and international), can you identify areas in which deficiencies exist that increase the risk of shipping hazardous materials?

* How would you describe your experiences In attempting to comply with the regulations contained in 49 CFR in terms of their ease of use and your perception that you take the required actions to reduce the risk of hazardous materials in transportation?

* What, if any, measures could DOT implement that would lower the risk that hazardous materials may pose while in the transportation system?

Another aspect that has the potential to impact the safety of the transportation system is the act of shipping or transporting undeclared hazardous materials (undeclared or "hidden" shipments are shipments offered for transportation, or subsequently transported, that are not identified as hazardous materials as required by regulation). DOT is generally only made aware of an undeclared shipment of hazardous materials after a related accident or incident occurs or if it is otherwise reported to DOT. Questions related to this issue include:

* To what extent are you aware of any problems associated with undeclared shipments of hazardous materials?

* What detection methods, if any, have you implemented to recognize potential shipments of undeclared hazardous materials?

*What prevention methods would you offer to DOT to reduce the practice of shipping or transporting undeclared shipments?

* Are undeclared shipments a result of ignorance or willfulness? Please describe.

* What is your experience concerning undeclared shipments occurring within the different modes of transportation (air, highway, rail and water)?

* Do you believe that either the risk level or volumes of activities associated with undeclared shipments is equal among the modes? Please describe.

An important segment of the Hazardous Materials Regulations is hazard communication. Hazard communication under the HMR is addressed in five components: Shipping papers, marking, labeling, placarding, and emergency response information. Questions related to this issue include:

* To what extent does the current regulatory system provide adequate hazard communication Information on shipments in transit?

* Are there other sources of information that provide hazard communication information and could they become the basis for an industry standard? For example, is there other information or documents in use related to hazardous materials in transit besides the information provided on a shipping paper that could be standardized or combined in one document?

The regulatory system permits the establishment of exceptions and exemptions that are intended to safely and efficiently expedite the movement of certain hazardous materials. Questions related to this issue include:

* Do exceptions and exemptions complicate the understanding of the regulations?

* Do exceptions and exemptions achieve an adequate level of safety?

* How would you recommend that DOT achieve its intended goal of safely and efficiently moving hazardous materials differently given the industry need for and benefit of these alternatives?

* What do you see as the major enforcement or emergency response concerns related to DOT's use of exceptions and exemptions?

Focus Group Meeting *# 2, Chicago, IL, August 11, 1999: "Effectiveness of* DOT's Approach for Gaining Compliance '

Focus Group Meeting #2 will focus primarily on issues involving reducing violations, means of intervention, and improving compliance with the regulations. To improve the level of compliance by industry DOT focuses its efforts at a variety of intervention points in the transportation system, including activities at the packaging, manufacturer, offeror and transporter stages. Intervention methods include regulations, education, training. outreach, inspection and enforcement. With respect to intermodal shipments, more than one modal administration has the opportunity to intervene with the same shipment as it passes from one mode of transportation to another.

DOT engages in numerous activities to provide information and improve awareness of and compliance with the safety requirements. These outreach activities include: Publishing notices in the **Federal Register; issuing** press releases-, using Internet web pages: conducting training seminars and public meetings; participating in stakeholder conferences; and distributing pamphlets, brochures, videos, and CD ROMS.

In Focus Group Meeting #2, we are interested in determining how effective DOT's approach is for reducing violations and increasing compliance. Questions related to this issue include:

* Historically, compliance inspection data reveal that placarding and shipping paper deficiencies are the most cited violations. How would you recommend that DOT increase compliance in these areas?

* Based on your experiences with DOT, please comment on which of DOT's intervention methods are most effective (regulations. education, training, outreach, inspection and enforcement). Why?

* Where do you believe DOT's intervention could be most effective (at the packaging, manufacturer, offeror or transporter stages) and what intervention approach should DOT employ?

* What are your observations and experiences regarding the depth and quality of DOT's compliance inspections? Please be specific, if possible, in your comments with respect to individual operating administrations within DOT (USCG, FAA, FHWA, FRA, and RSPA).

* Are DOT inspectors helpful in providing compliance assistance and in explaining non-complying conditions? If possible, please be modal specific.

* What current DOT outreach efforts (e.g., informational pamphlets, seminars, classroom training and on-site assistance) do you have experience with and which are the most effective?

* What other, if any, DOT outreach activities do you suggest?

DOT's efforts to influence the level of compliance with the HMR involve use of the civil penalty assessment process including notices of probable violation, final orders, administrative law Judge hearings, ticketing, and alternative means of dispute resolution, including alternatives to traditional enforcement. Questions related to this issue include:

* Do you believe civil penalties are effective in pining compliance?

* Can you recommend ways to improve the civil penalty program?

* What are your major concerns about the process DOT uses for determining the penalty amounts in relationship to a violation of the HMR?

The HMR include training requirements which are intended to ensure employees are competent to fulfill their roles; however, the adequacy of the scope or frequency of the required training is unknown. DOT has observed that many shippers and carriers employ the services of third-party trainers (i.e., non-governmental parties who provide training on the HMR). Questions related to this issue include:

* Do you believe the existing training standards are adequate to ensure all personnel responsible for the safe transportation of hazardous materials understand the pertinent requirements of the HMR?

* If not, how would you modify the training or employee competency requirements to improve this aspect of the safety scheme?

DOT currently uses a variety of approaches to work with state personnel to gain compliance with the HMR. These approaches include: (1) Providing funding to states to increase compliance with the HMR through the deployment of wide-scale inspections and enforcement activities; (2) using a mix of Federal and state inspectors in some of DOT's operating administrations-, and (3) conducting inspections and other activities using only Federal DOT inspectors. Questions related to this issue include:

* How effective are DOT's different approaches of using Federal and/or state personnel as an intervention practice?

* Please explain if, and why, one approach is better than another.

Domestic and foreign shipper practices have the potential to significantly affect hazardous materials safety and influence the level of compliance with the HMR. Deficiencies discovered by modal inspectors are typically tracked back to the original shipper to rectify the deficiency. Such corrective follow up is more difficult for import shipments. Effective outreach overseas is a challenge. Questions related to this issue include:

* If you are an importer of hazardous materials, how frequently do you receive hazardous materials that do not comply with the regulations?

* To the extent that there are noncomplying shipments, what do you believe is the major reason (ignorance or willfulness)? Please describe.

Focus Group Meeting #3, Washington *DC,* August 17,1999: "Measuring *DOT's* Performance in Hazardous Materials Safety"

Focus Group Meeting #3 will focus primarily on issues involving DOT's performance measures as it relates to minimizing the risk of hazardous materials transportation. In this meeting, we are concerned about DOT's performance with regard to reducing HM safety risks and In determining the best measures of success.

In DOT's Performance Plan for Fiscal Year 2000, the primary hazardous materials safety performance goal is to reduce the number of serious HM incidents in transportation (to 411 or fewer in the year 2000 from a peak of 464 in 1996.) DOT defines a serious hazardous materials incident as one that involves a fatality or major injury due to a hazardous material, closure of a major transportation artery or facility or evacuation of six or more persons due to the presence of a hazardous material, or a vehicle accident or derailment resulting in the release of a hazardous material.

Trends In serious Incidents in the past decade have been fairly stable –

averaging about 407 per year since 1990. In a typical year, serious hazardous materials incidents account for 10-15 deaths (with the notable exception of 1996, when the Valuejet crash resulted in 110 deaths,) and fewer than 300 major injuries. Because of the inherent risk in handling and transporting hazardous materials, there are limits to how far the number of incidents could be reduced. Furthermore, serious incidents often require mitigation measures that are mode specific and might not benefit all hazardous materials operations.

There are safety advocates who maintain that any unintentional release, large enough to be reportable, is a flag indicating safety risks or flaws in operating and handling procedures. Minimizing these releases, many experts argue, should be the goal of the regulatory agencies. Looking at all reported hazardous materials incidents-serious and non-serious-there has been an overall decline since the high of 16,000 in 1983, with the numbers fluctuating between fewer than 10,000 in 1990 to under 14,000 last year. Assessing changes in the total number of incidents to be used as a measure of effectiveness in conjunction with close integration of the incident reporting system in the entire process of hazardous materials intervention-from training, inspection, and enforcement could be used by DOT to identify the underlying causes of many incidents.

In Focus Group Meeting #3, we are interested in gauging DOT's success and in developing appropriate measures or candidate measures.

Questions related to this issue include:

* Are serious incidents the best measure of our success in reducing risk in hazardous materials transportation?

* Is the goal of reducing the number of serious incidents by a targeted amount the best alternative?

* Would trends in all unintentional releases of hazardous materials be a better Indicator of how well we have succeeded in controlling the risk of hazardous materials in transportation?

* How can we best measure the success of the hazardous materials program? How would you evaluate the overall effectiveness of the hazardous materials intervention program in addressing the level of risk hazardous materials pose in transportation?

Issued in Washington, DC on June 30. 1999

Jackie A. Goff,
Co-Chair, *Hazardous Materials Program* Evaluation Team.

George Whitney,
Co-Chair, *Hazardous Materials* Program Evaluation Team. [FR Doc. 99-17175 Filed 7-6-99; 8:45 am]

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METHODOLOGY

The Secretary's Strategic Plan for 1999–2002 requires the Assistant Secretary for Budget and Programs, along with the Inspector General, to work with the Operating Administrations to develop and implement a comprehensive 5-year program evaluation plan to be included in the FY 2000 Performance Plan. The FY 2000 Performance Plan included a multi-modal program evaluation of the Department's Hazardous Material Compliance and Enforcement Program.

The objectives of the department-wide hazardous materials program evaluation were: (1) to document current hazardous materials movements, Operating Administrations' programs, and program delivery, and (2) to assess the effectiveness of the Department of Transportation's (DOT) overall hazardous materials program as it affects each step in the hazardous materials transportation process, from packaging to receiver, recommend improvements, and identify areas for further study. The evaluation was jointly led by the Research and Special Programs Administration and the Office of Inspector General.

Announcing the Program Evaluation and Establishing the HMPE Team

The HMPE sponsors, DOT's Assistant Secretary for Budget and Programs/Chief Financial Officer, the Inspector General, and the Administrator of the Research and Special Program Administration, issued a memorandum on November 3, 1998, notifying the other heads of DOT organizations with hazardous materials responsibilities, FAA, FHWA, FRA, and the Coast Guard, of initiation of the program evaluation. The memorandum requested each of the DOT organizations to select an experienced hazardous materials member of their staff for the program evaluation Team. The Hazardous Materials Program Evaluation (HMPE) Team consisted of one member from each of the Operating Administrations (Coast Guard, FAA, FRA, FHWA, and RSPA) and the OIG. The HMPE Team was supported by one staff from the VOLPE[1] Center and two OIG auditors. The Operating Administrations' team members have over 80 years experience in the hazardous materials area. The HMPE team was co-chaired by a representative from RSPA and the OIG.

Program Evaluation Design Methods

The evaluation was designed to employ a combination of complementary analytical techniques including process and efficiency/effectiveness evaluation

[1] Volpe Center provided a senior economist to support the Team.

methodologies. For example, the evaluation strategy used the process evaluation methodology to assess the extent to which DOT's hazardous materials transportation program has been implemented as intended.

ONE-DOT Partnering for Excellence Workshop

The HMPE Team, along with hazardous materials field inspectors, managers, and legal counsel from each Operating Administration, participated in a 2-day ONE-DOT Partnering for Excellence Workshop[2]. The Team spent 1.5 days learning to work as a cross-modal team and identifying cross-modal projects that require shared resources and collaborative effort. The balance of the 2 days was used developing issues, discussing methodologies, and writing action plans to accomplish the work required under Objective 1 of the program evaluation.

Communications Plan and Glossary of Terms

The HMPE Team recognized a need for a communication plan and a glossary of common terms. The purpose of the communication plan was to outline the process, procedures and guidelines the Team used to:

- Keep the public apprised about the program evaluation and invite their input;
- Inform the Secretary of Transportation, Operating Administrators, and Sponsors about the Team's activities and emerging issues; and
- Track Team generated documents.

The HMPE Team found that the same terms used by the Operating Administrations, within the Department's hazardous materials program, had different meanings. Therefore, the Team developed a Glossary of Terms to use throughout the HMPE.

Request for Program Data

Operating Administration HMPE Team members provided hazardous materials program data for their organizations. The Team members provided information on: 1) program structure (organization), 2) financial resources (total safety versus dedicated hazardous materials), 3) personnel resources allocated to the program (expressed in Full Time Equivalents), plus a description of their duties and responsibilities, 4) Operating Administration policies, procedures, and plans pertaining to hazardous materials, 5) hazardous materials laws and regulations,

[2] Counsel from FHWA did not participate in the Partnering for Excellence Workshop.

and 6) carrier, shipper, and incident statistics, and 7) anything else the Team needed to know about their hazardous materials program.

Analysis of Department's Strategic/Performance Plans

The Government Performance and Results Act (GPRA) of 1993 requires that each Department prepare a 5-year Strategic Plan and an Annual Performance Plan. The Department's Strategic Plan Goal for Safety does not specifically address hazardous materials safety. The Performance Plan for FY 2000 contains one goal under Safety pertaining to hazardous materials transportation: "Reduce the number of serious hazardous materials incidents in transportation, to 411 or fewer in 2000 from a peak of 464 in 1996." The HMPE Team conducted an analysis of the Strategic/Performance Plans developed by the Operating Administrators to identify hazardous materials goals and performance measures and whether they were consistent with the Department's goal.

First Federal Register Notice Announces Program Evaluation

The Department issued a Federal Register notice on March 9, 1999, announcing the start of the HMPE and formation of the HMPE Team. The Federal Register notice included the HMPE objectives and scope of the HMPE. Hazardous materials shipments by pipelines and bulk shipments by tanker vessel were excluded, since these two areas, while important, do not generally involve more than one mode and would not fall within the cross-modal intent of the HMPE.

Modal Inspections

To gain personal experience about the multi-modal inspection process, the HMPE Team participated in inspection exercises conducted by each mode as well as two intermodal inspection activities. Although each modal Team member had extensive hazardous materials inspection experience (ranging from 27 years to 10 years, and totaling over 80 years for the entire Team), the Team believed it was important to observe how each Operating Administration performed hazardous materials inspections.

Over a 2-month period the HMPE Team observed and participated in: (1) a multi-modal Hazardous Materials Strike Force (HAZSTRIKE) at Baltimore International Airport (BWI) and Baltimore's Dundalk Marine Terminal; (2) RSPA inspections throughout New Jersey and in Seattle, Washington; (3) FMCSA's "Shipper Check 1999"; (4) railroad inspections in Chicago; and, (5) a week long multi-modal HAZSTRIKE at Boston's Logan International Airport. The Team

also toured RSPA's independent testing facility in Tobyhanna, Pennsylvania, and observed containers being tested to ensure they meet DOT specifications for transporting hazardous materials.

Observations from participating in the Operating Administrations' inspections and intermodal HAZSTRIKEs were used by the Team to develop an understanding of the Department's interagency hazardous materials program, and to identify issues on which to focus interviews of the Operating Administration hazardous materials program managers. The information gathered during field observations were also used in developing questions for focus group meetings conducted with industry and the general public.

HAZSTRIKE at Baltimore International Airport and Dundalk Marine Terminal

The 2-day HAZSTRIKE at the Baltimore International Airport (BWI) and the Dundalk Marine Terminal were two separate activities, with the FAA coordinating the inspections at BWI and the Coast Guard coordinating inspections at the Dundalk Marine Terminal. At BWI, the HMPE Team observed FAA inspectors conducting dangerous goods/cargo security assessments of major air carriers and indirect air carriers (freight forwarders), who tender cargo to air carriers. During the assessments, FAA evaluated compliance with the hazardous materials and cargo security regulations. The HMPE Team joined the inspection teams in tracing hazardous material shipments upstream from the air carriers to the indirect air carrier to the original shipper. The Team also participated in truck stops at the airport to identify and check compliance with hazardous materials regulations by vehicles transporting hazardous materials to/from the airport.

At the Dundalk Marine Terminal, the HMPE Team participated in inspections of trucks entering and exiting the terminal. Participants in the marine terminal inspections were DOT inspectors and representatives from the U.S. Customs Service, Maryland State Department of Transportation, the Maryland State Patrol, and the Port Police. While working with the Coast Guard and U.S. Customs, the HMPE Team requested the Coast Guard and U.S. Customs to open a number of containers to allow the Team to determine compliance of the shipment with hazardous materials regulations.

RSPA Inspections

Hazardous materials are transported in various types of containers, including boxes, drums, and cylinders, that must meet certain specifications established by

RSPA in 49 CFR Parts 178 through 180. To gain an understanding of RSPA's inspection activities, HMPE Team members accompanied RSPA inspectors on a variety of inspections in New Jersey and Seattle, Washington. The inspections included drum reconditioners; steel, plastic, and fiber drum manufacturers; cylinder retesters; cylinder manufacturers; a medical waste shipper and disposal site; hazardous materials shippers including explosive shippers; and third-party testing laboratories.

Team members also inspected a third-party testing facility which conducts tests of containers and certifies to the manufacturers that the containers meet DOT specifications for transporting hazardous materials. This experience gave the HMPE Team a fuller understanding of the various United Nations and DOT package specifications.

RSPA's Independent Testing Facility – Tobyhanna, Pennsylvania

Hazardous materials are transported in various types of containers such as boxes, drums, and cylinders that must meet specifications established by RSPA in 49 CFR Parts 178 through 180. There are many domestic and international manufacturers of hazardous materials containers. Most of the manufacturers self-certify that their packagings meet the performance specifications contained in the hazardous materials regulations. To test manufacturers' compliance with the regulations, RSPA has contracted with the U.S. Army Materiel Command Logistic Support Center package testing facility in Tobyhanna, Pennsylvania. At the facility, the Team observed package testing for leakproofness, hydrostatic pressure, and various drop tests, as well as testing procedures for other small package tests. The Team also learned about the small package testing selection process and the equipment used to perform tests.

FMCSA's "Shipper Check 1999"

The HMPE Team participated in FMCSA's annual "Shipper Check" activity. The primary purpose of "Shipper Check 1999" was to identify hazardous materials shippers so FMCSA could plan future inspections at shippers' facilities. Four HMPE Teams worked with state and FMCSA inspectors at motor carrier terminals.

Railroad Inspections in Chicago

From April 25 through 30, 1999, the HMPE Team participated in inspections of hazardous materials moving by railroad in the Chicago metropolitan area.

Intermodal trailers were opened and inspected for compliance with hazardous materials regulations. Hazardous materials packages were traced to a United Parcel Service facility and observed during transfer at that facility.

HAZSTRIKE at Boston's Logan International Airport

Logan International Airport in Boston, Massachusetts was the site of a major unannounced HAZSTRIKE that the HMPE Team participated in from March 29 through April 2, 1999. The normal duration of a HAZSTRIKE is 5 to 8 days. The Team participated in assessments of air carriers, indirect air carriers, and shippers to ensure compliance with HMR requirements. The assessments involved a review of shipping paper documents and training records for employees involved in transporting hazardous materials. The 70 inspectors from 11 different agencies who participated in the HAZSTRIKE were from:

- Federal Aviation Administration – Special Agents from eight regions,
- United States Customs Service,
- Department of Commerce – Bureau of Exports,
- United States Postal Service,
- Massachusetts Port Authority Fire-Rescue,
- Massachusetts State Police, and
- The HMPE Team.

The HAZSTRIKE inspectors were divided into six Teams: four to conduct assessments of air carriers, indirect air carriers, and shippers; and two to conduct motor carrier inspections. HMPE Team members joined the six Teams and participated in all facets of the HAZSTRIKE. The HMPE Team received a briefing on cargo security and then participated in an exercise that tested the package acceptance practices of nine air carriers. Team members visited the Federal Express Airport Cargo Facility to observe and gain an understanding of the hazardous materials sorting/distribution process.

The Team also visited the United States Postal Service (USPS) Airport Mail Facility, viewed the mail sorting/distribution process, and received a briefing on the USPS policy for the acceptance and handling of parcels containing hazardous materials. The Team thought it was important to observe USPS because millions of packages are entered into the transportation stream daily by USPS, but it is statutorily exempted from the hazardous material regulations.

COHMED Conference in Salt Lake City, Utah

The HMPE Team participated in a Cooperative Hazardous Materials Enforcement Development (COHMED) conference. The COHMED program is an outreach activity of RSPA. COHMED works to promote coordination, cooperation, education and communication for Federal, state, local agencies and industry having enforcement, response, and management responsibilities for the safe transportation of hazardous materials.

During the Conference's General Session, the HMPE Team provided the objectives of the program evaluation. The HMPE Team members discussed issues participants had about the HMPE and DOT's hazardous materials program. Team members also attended break-out sessions which covered topics ranging from training requirements to exemptions.

The COHMED conference afforded the HMPE Team a better understanding of the advantages and deficits of the various hazardous materials programs from the perspective of industry, first responders, and enforcement personnel. The break-out sessions gave the Team an opportunity to learn what parts of the hazardous materials program are working well and what needs improving from those who work with hazardous materials on a daily basis. It also gave industry an opportunity to express their concerns to the HMPE Team.

Second Federal Register Notice Announces Focus Group Meetings with the Hazardous Materials Community

The HMPE Team sought broader input from the hazardous materials industry, emergency responders, and the public at large concerning the transportation of hazardous materials. On July 7, 1999, the HMPE Team announced in the Federal Register that it would conduct three public focus group meetings to solicit comments concerning the Department's Hazardous Materials Programs. The first meeting was held on July 22, 1999, in Washington, DC, and addressed the "Effectiveness and Adequacy of DOT's Hazardous Materials Regulatory Program." The second meeting was held on August 11, 1999, in Chicago, Illinois, and addressed the "Effectiveness of DOT's Approach for Gaining Compliance." The third meeting was held on August 17, 1999 in Washington, DC, and discussed methods for "Measuring DOT's Performance in Hazardous Materials Safety." The Federal Register Notice included specific questions under each topic that served to focus the discussion at the meetings. The Federal Register notice also offered the public the opportunity to provide written responses to the questions contained in the notice.

An independent professional facilitator conducted the focus group meetings to ensure they were conducted in a neutral manner and that everyone's comments were considered. Each meeting had a panel of 6 to 14 individuals representing the community of shippers, carriers, packaging manufacturers, hazardous materials employees, enforcement personnel, emergency responders, trade associations, labor representatives, and other interested parties involved in the transportation of hazardous materials. An audience of 30 to 60 individuals attended the focus group meeting. The HMPE Team used information gathered during the focus group meetings and written responses to questions in the Federal Register Notice to further develop issues concerning DOT's hazardous materials program.

Interviews of Hazardous Materials Program Managers within the Department

The HMPE Team interviewed DOT hazardous materials officials and received briefings on program activities to gain a better understanding of programs and intervention techniques. The HMPE Team interviewed the:

• Associate Administrator for Hazardous Materials Safety	RSPA
• Director, Office of Hazardous Materials Initiatives and Training	RSPA
• Director, Office of Hazardous Materials Enforcement	RSPA
• Director, Office of Hazardous Materials Technology	RSPA
• Acting Director, Office of Hazardous Materials Standards	RSPA
• Coordinator, International Standards	RSPA
• Director, Field Activities Marine Safety and Environmental Protection Directorate	USCG
• Director, Office of Motor Carrier Enforcement	FMCSA
• Hazardous Materials Team Leader	FMCSA
• Manager, Dangerous Goods and Cargo Security Division	FAA
• Staff Director, Hazardous Materials Division	FRA
• Research Analyst (Contract)	BTS

Briefings and Meetings

September to December, 1999 – The HMPE team conducted a series of briefing for the HMPE Sponsors (Assistant Secretary for Budget and Programs/Chief Financial Officer, the Inspector General, and the Administrator, Research and Special Programs Administration) to present the results for Objective 1, program descriptions, and Objective 2, program critique. During this period the Team further refined findings and developed report recommendations.

December 14, 1999 – The team briefed DOT's Deputy Secretary and HMPE Sponsors on evaluation results, at which time the Deputy Secretary asked the team to brief DOT's Senior Leadership Team (comprised of DOT's Secretarial Officers and heads of Operating Administrations).

January 13, 2000 – The team briefed the Senior Leadership Team on each of the recommendations contained in the report and the Deputy Secretary asked the HMPE team to meet with senior policy representatives from each of the affected Operating Administrations to develop an implementation strategy to establish the recommended institutional capacity to coordinate hazardous materials programs in the Department.

February 4 and 7, 2000 – The enhanced team (HMPE team and senior policy representatives) met to discuss various organizational locations and structures for the institutional capacity. The enhanced team made recommendations on the placement of an institutional capacity within DOT and key characteristics they believed such an organization should possess.

February, 2000 – The Heads of Operating Administrations with hazardous materials responsibilities and Secretarial Officers reviewed drafts of the report and provided the HMPE team with their technical and substantive comments which were incorporated in the report.

March 16, 2000 – The team briefed the Department's Senior Leadership Team on strategies to implement the institutional capacity recommendations developed by the enhanced HMPE team on February 4 and 7. A unanimous decision was reached by the Senior Leadership Team to place this capacity in the Office of Intermodalism under the Associate Deputy Secretary. The Deputy Secretary directed that DOT should begin drafting Secretarial delegations to place the additional responsibilities and authorities under the Associate Deputy Secretary.

March 20, 2000 – The team met with a delegation drafting team comprised of representatives from RSPA's Office of Chief Counsel and the Department's Assistant General Counsel for Regulation and Enforcement to discuss the responsibilities and authorities necessary for the Office of Intermodalism to carry out the HMPE team's recommendations.

DATA SOURCES USED IN THE HMPE

An essential component of hazardous materials measurement and evaluation is complete and accurate data. Such data permits identification of causal factors contributing to hazardous materials incidents, so that program processes for improving hazardous materials safety can be established. The HMPE team realizes that all data are imperfect in some fashion and present some degree of uncertainty. Therefore, the understanding of data limitations is critical to manage for results. However, very little quality data are available within the Department on the transportation of hazardous materials.

The HMTL requires DOT to maintain a central reporting system[1] and to provide information for emergency response to hazardous materials transportation incidents. To carry out this mandate, RSPA maintains the Hazardous Materials Information System (HMIS), which includes data reported by carriers over the past 30 years. HMIS data are made available to Federal, state, local, and private emergency response organizations. RSPA works with the Coast Guard and EPA to maintain an around-the-clock National Response Center and publishes and distributes an Emergency Response Guidebook approximately every three years. While not statutorily required by HMTL, the DOT agencies carrying out the HMTL maintain a number of other data systems that track hazardous materials incidents, inspections, and enforcement cases.

Hazardous Materials Data Sources

The HMPE team combined data from a number of sources to conduct the evaluation. However, the HMPE team found that with few exceptions, existing information sources have deficiencies that limit their value in supporting hazardous materials program evaluation. This appendix lists the sources of information the team believed appropriate for evaluating the department's hazardous materials programs. **Gaps in information or limitations are noted in bold:**

- Vehicle Inventory and Use Survey (VIUS), 1992, formally known as the Truck Inventory and Use Survey (TIUS). This document is used by Bureau of Transportation Statistics (BTS) to determine the number of vehicles being used to transport hazardous materials and the distances they travel**. (However, the data is not reliable because VIUS double counts trucks carrying hazardous materials. This is due to multiple placarded loads being counted as multiple trucks. Also, the survey**

[1] 49 United States Code § 5121

sample size is insufficient to provide detailed information such as specific hazard by type of truck.)

- Commodity Flow Survey, 1993, (Period 1988-1992). Conducted by the Bureau of Census and compiled and distributed by the BTS. This document was used to determine the volume of hazardous materials transported in the United States on a daily and annual basis. **(This is a survey based upon sampling the domestic industry that is conducted every 5 years. While the Commodity Flow Survey's (CFS) main strength is its multimodal nature, it has limitations. The CFS generally reflects shipments from the point of manufacture to first destination but excludes most establishments in retail. Finally, it is not focused on hazardous materials and does not define products within the meaning of Title 49 Code of Federal Regulations.)**

- Commodity Flow Survey, 1997, (Period 1993-1997). This CFS includes hazardous materials as a reportable element. However, this document was in draft during most of the evaluation. Therefore it became available too late in the program evaluation (December 1999) to provide sufficient time for incorporation of usable data into this evaluation. **Although CFS is the most comprehensive source of data on the domestic movements of goods and materials, some industries and commodities and most domestic movement of imports are not included. Also, it continues to exclude most retail establishments.**

- RSPA's Biennial Report on Hazardous Materials Transportation, (reporting period 1991-1997). These reports were used to analyze the data reported to Congress by RSPA on hazardous materials transportation in the United States. **(The Biennial Report simply compiles data given to RSPA by the Operating Administrations. The accuracy or the consistency of the data contained in the Biennial Report is not verified by RSPA before publication, or analyzed to meet the DOT requirement to report on program effectiveness and voluntary compliance. Rather it is used by RSPA to report to Congress on the transportation of hazardous materials in the United States.)**

- Transportation Research Board, Hazardous Materials Shipment Information for Emergency Response, Special Report 239, 1993. This report to Congress discusses RSPA's further efforts to meet the

requirements of Hazardous Materials Transportation Uniform Safety Act. The study devoted significant effort to analyzing past hazardous materials transportation incidents, as well as the HMIS.

- Directory of Transportation Data Sources, 1996. Published by the Bureau of Transportation Statistics. This document was used to identify sources of data about the transportation of hazardous materials. The HMPE team analyzed three sources of data identified in the directory.

- California Commercial Motor Vehicle (CMV) Accident Statistics, 1996. Prepared by FMCSA's San Francisco, CA. Office. This document was prepared using data from the California traffic records system, which tracks injuries, fatalities, and property damages. The report concluded that non-commercial drivers are responsible for 69% of all CMV fatal accidents, and that improved "public" outreach is necessary to reduce this percentage. **(The report noted that most police reports failed to record the amount of property damages. The report does not segregate data by hazardous material or non-hazardous material, and does not indicate commodities carried. Therefore, we were unable to determine number of hazardous material fatalities to test against RSPA's HMIS data).**

- Large Truck Crash Profile: The 1997 National Picture, 1998. Prepared by the Analysis Division of the Office of Motor Carrier Safety. The report notes, in part, that:

  - the Motor Carrier Management Information System only receives 62% of the truck and bus crash reports;

  - the rate of injuries and fatalities is increasing;

  - failure to yield/ran out of traffic lane is the largest single driver reason for crashes.

  (The sources used by the report did not provide any in-depth data on the causes or reasons for truck and bus crashes. Without this data, there is no way to validate the causal representations used in the report.)

- RSPA Draft report on A National Risk Assessment for Hazardous Materials Transportation, 1998. This report was prepared by the

Argonne National Laboratory for RSPA's Office of Hazardous Materials Technology. The report **notes as a limitation** that any assessment of risk is limited by the quantity and quality of data available to the Department. For this reason, the data in the HMIS is multiplied by a factor of *150 percent* to more closely equate to what should be reported. The report also noted the lack of causal data about incidents, and the lack of package reporting on incident forms. **(The report is in draft and undergoing a peer review. The report makes several assumptions and, by their own admission, uses unsupported percentages to adjust data deficiencies. Therefore, the only information used pertains to the known data limitations of HMIS.)**

- RSPA's Report on Hazardous Materials Shipments, 1998. Prepared by the Office of Hazardous Materials Safety. This report was used as a source of information on shipments, movements, and tonnage of hazardous materials shipped within the United States. **(In this report, RSPA acknowledged data limitations as follows:)**

  "This report deliberately uses the word 'estimate.' It does not presume to provide dispositive, unchallengeable 'counts.' It is well known, for example, that industries continually undertake operational changes to increase efficiencies, reduce risk, or both. In gasoline distribution, for example, the present trend is toward use of larger vehicles and fewer reshipments of product. Even as U.S. daily consumption of petroleum products has grown steadily from 17 million barrels per day in 1992 to close to 19 million barrels per day in 1998, the number of daily petroleum product shipments could be declining, depending upon corporate distribution and fleet utilization strategies. Thus, these estimates may be viewed as subject to continuing review and re-calibration. Suggestions from industry and other knowledgeable sources regarding how to improve the underlying data assumptions and the accuracy of the overall estimates are welcome."

- National Transportation Statistics, 1998. Published and distributed by the BTS. Chapter 3, Table 3.6 lists hazardous materials safety and property damage. **The source for this information is RSPA's HMIS, which at the time was limited to interstate incidents. Also, there is a known potential for underreporting of incidents to the HMIS. See discussion of Hazardous Materials Data Collection.**

- Risk/Benefit Cost Analysis for Prohibiting Hazardous Materials in External Piping of MC 306/DOT 406 Cargo Tank Motor Vehicles, 1999. This report was prepared by RSPA's Office of Hazardous Materials Technology. The report indicates it is a preliminary report that provides a "…first-cut look at risks inherent in the current system, the level of technology development and possible ways to eliminate or reduce risk…." The report identifies the limitations on the exact numbers of tank trailers in flammable or combustible liquid service, and notes that for the period 1990-1997, 57 gasoline fatalities accounted for over 75% of flammable and combustible fatalities. The report also notes the problems with underreporting of damages in incident reports, and as such applies a factor of *150%* to adjust all HMIS data for both interstate and intrastate incidents. **(The report is preliminary and notes several shortfalls in HMIS data reporting. The use of unsupported percentages by RSPA to adjust for the HMIS's data deficiencies limited the report's usefulness.)**

- Hazardous Materials Risk Assessment: Year Portrait of Hazardous Materials Accidents/Incidents and Impacts, 1999. This is a final report prepared by Battelle for the Office of Motor Carrier Safety. The report notes, "This project was designed to assist the Department of Transportation (DOT) in achieving their strategic goal of reducing the rate and severity of transportation fatalities and injuries in hazardous materials transportation and of reducing the dollar loss from high-consequence, reportable transportation accidents." However, this report only covers phase I, which characterizes the shipment impacts for one year of Class 3 hazardous material shipments. The report notes the lack of data, "…there is no good national source of traffic flow data comparable to HMIS and Safetynet for accidents and incidents." However, data was used from state databases to supplement DOT data. The state data indicated that these other databases reported 18 fatalities due to hazardous materials versus the 11 reported in HMIS. **(Difference in fatalities may be due to RSPA's requirement that only hazardous materials "caused" deaths are counted. The other reporting databases do not have the necessary means to identify deaths by hazardous materials versus deaths caused by the accident.)**

Hazardous Materials Data Collection

The team also analyzed the Department's system for capturing hazardous materials data reported to the Congress, the HMIS maintained by RSPA and its subsystem, the Incident Reporting Subsystem. Information contained in the HMIS is reported (telephonically) to the National Response Center and in writing to RSPA on DOT Form 5800.1. Data in the HMIS were compared to calls to the National Response Center, state databases, and other data sources to verify its accuracy. The 1999 Battelle study identified above **found that RSPA's HMIS database has not received written reports (Form 5800.1) for all serious hazardous material incidents. Battelle conducted a review of eight states and found a total of 18 hazardous materials related fatalities in 1996. For the same reporting period, the HMIS reported only 11 fatalities only one of which was found in the Battelle study (indicating 17 were not in HMIS).**

In addition, RSPA issued a draft report on October 28, 1998 identifying the problems or limitations with the HMIS data. RSPA stated:

> **"These include concerns about the accuracy of the reported data, particularly related to underreporting and misreporting….**
>
> **Since these data *(HMIS data)* do not address changes over time in the transportation environment, they do not provide a complete picture. These reasons also limit the data's ability to predict future incident characteristics and support risk analysis. Risk analyses also require more data than the Incident Reporting Subsystem currently provides, specifically data related to transportation system conditions; conditions at loading, unloading, storage and transfer facilities; packaging; the material; the environment; the vehicle; and human factors. Human factors are particularly important to understand because the data showed that more than three-quarters of all reported incidents are attributed to human error. Risk analyses and cause and effect analyses are important in supporting rulemaking initiatives and efforts to improve safety.**
>
> **The data are also limited in their ability to support cause and effect analysis, primarily because insufficient information is collected on root cause, which is the fundamental underlying reason that leads to an incident. For example, the root cause of a leak from a loose valve may be that corrosion prevented the valve from being sufficiently tightened."**

Office of Technology Assessment Reports

- U.S. Congress, Office of Technology Assessment, Report on the Transportation of Hazardous Materials, 1986. This document was used primarily to gain a historical background of the hazardous materials program within the Department.

- U.S. Congress, Office of Technology Assessment. Gearing up for Safety: Motor Carrier Safety in a Competitive Environment, OTA-SET-382, September 1988. This document was used primarily to gain a historical background on larger safety risks pertaining to carriage by commercial truck.

Prior NTSB, DOT, General Accounting Office, and OIG Reports Considered by the HMPE Team.

NTSB Reports

Safety Effectiveness Evaluation of Federal and State Enforcement Efforts in Hazardous Materials Transportation by Truck,
NTSB-SEE-81-2, February, 1981

DOT Reports

Report of the Hazardous Materials Transportation Task Force

September, 1978

GAO Reports

Programs For Ensuring The Safe Transportation of Hazardous Materials Need Improvement
GAO/CED-81-5, November 4, 1980

Enhancing Policy and Program Effectiveness Through Improved Management
GAO/RCED-87-3, April 13, 1987

DOT Should Better Manage Its Hazardous Materials Inspection Program
GAO/RCED-90-43, November 17, 1989

Information Strategy Needed for Hazardous Materials
GAO/IMTRC-91-50, September 25, 1991

OIG Reports

Hazardous Materials Program – Federal Railroad Administration – Region 7
Report No. R9-FR-5-006, April 7, 1995

Railroad Safety Program
Report No. R9-FR-7-003, December 19, 1996

Management Advisory, Hazardous Materials Registration Program
Report No. TR-1998-110, April 3, 1998

Aviation Security
Report No. AV-1998-134, May 27, 1998

Review of Security Controls Over Air Carrier Shipments
Report No. AV-1998-149, June 2, 1998

Dangerous Goods/Cargo Security Program
Report No. AV-1998-178, July 23, 1998

Container Inspection Program – USCG
Report No. MA-1998-200, September 8, 1998

Aviation Safety
Report No. AV-1999-069, March 30, 1999

Motor Carrier Safety Program
Report No. TR-1999-091, April 26, 1999

Transportation Research Board (TRB) Studies and Information Services

The HMPE team utilized the TRB library and online Transportation Research Information Services (TRIS). The TRIS database is the world's largest and most comprehensive bibliographic resource on transportation information.

Literature Search

The HMPE team reviewed appropriate technical, industry and government produced articles, House and Senate conference reports, and other available data.

DOT Form 5800.1 - Hazardous Materials Incident Report

DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS INCIDENT REPORT

Form Approved OMB No 2137 0039

INSTRUCTIONS: Submit this report in duplicate to the Information Systems Manager, Office of Hazardous Materials Transportation, DHM-63, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. If space provided for any item is inadequate, complete that item under Section IX, keying to the entry number being completed. Copies of this form, in limited quantities, may be obtained from the Information Systems Manager, Office of Hazardous Materials Transportation. Additional copies in this prescribed format may be reproduced and used, if on the same size and kind of paper.

I. MODE, DATE, AND LOCATION OF INCIDENT

1 MODE OF TRANSPORATION ☐ AIR ☐ HIGHWAY ☐ RAIL ☐ WATER ☐ OTHER

2 DATE AND TIME OF INCIDENT (Use Military Time e.g. 8:30am = 0830, noon = 1200, 8pm = 1800, midnight = 2400) Date TIME

3 LOCATION OF INCIDENT (Include airport name in ROUTE/STREET if incident occurs at an airport)

CITY STATE

COUNTY ROUTE/STREET

II. DESCRIPTION OF CARRIER, COMPANY, OR INDIVIDUAL REPORTING

4 FULL NAME

5 ADDRESS (Principal place of business)

6 LIST YOUR OMC MOTOR CARRIER CENSUS NUMBER, REPORTING RAILROAD ALPHABETIC CODE, MERCHANT VESSEL NAME AND ID NUMBER OR OTHER REPORTING CODE OR NUMBER

III. SHIPMENT INFORMATION (From Shipping Paper or Packaging)

7 SHIPPER NAME AND ADDRESS (Principal place of business)

8 CONSIGNEE NAME AND ADDRESS (Principal place of business)

9 ORIGIN ADDRESS (If different from Shipper address)

10 DESTINATION ADDRESS (If different from Consignee address)

11 SHIPPING PAPER/WAYBILL IDENTIFICATION NO

IV. HAZARDOUS MATERIAL(S) SPILLED (NOTE: REFERENCE 49 CFR SECTION 172.101.)

12 PROPER SHIPPING NAME	13 CHEMICAL/TRADE NAME	14 HAZARD CLASS	15 IDENTIFICATION NUMBER (e.g. UN 2764, NA 2020)

16 IS MATERIAL A HAZARDOUS SUBSTANCE? ☐ YES ☐ NO

17 WAS THE RQ MET? ☐ YES ☐ NO

V. CONSEQUENCES OF INCIDENT, DUE TO THE HAZARDOUS MATERIAL.

18 ESTIMATED QUANTITY HAZARDOUS MATERIAL RELEASED (Include units of measurement)	19 FATALITIES	20 HOSPITALIZED INJURIES	21 NON HOSPITALIZED INJURIES
22 NUMBER OF PEOPLE EVACUATED			

23 ESTIMATED DOLLAR AMOUNT OF LOSS AND/OR PROPERTY DAMAGE, INCLUDING COST OF DECONTAMINATION OR CLEANUP (Round off in dollars)

A PRODUCT LOSS	B CARRIER DAMAGE	C PUBLIC/PRIVATE PROPERTY DAMAGE	D DECONTAMINATION/ CLEANUP	E OTHER

24 CONSEQUENCES ASSOCIATED WITH THE INCIDENT ☐ VAPOR (GAS) DISPERSION ☐ MATERIAL ENTERED WATERWAY SEWER
☐ SPILLAGE ☐ FIRE ☐ EXPLOSION ☐ ENVIRONMENTAL DAMAGE ☐ NONE ☐ OTHER

VI. TRANSPORT ENVIRONMENT

25 INDICATE TYPE(S) OF VEHICLE(S) INVOLVED ☐ CARGO TANK ☐ VAN TRUCK/TRAILER ☐ FLAT BED TRUCK TRAILER
☐ TANK CAR ☐ RAIL CAR ☐ TOFC/COFC ☐ AIRCRAFT ☐ BARGE ☐ SHIP ☐ OTHER

26 TRANSPORTATION PHASE DURING WHICH INCIDENT OCCURRED OR WAS DISCOVERED
☐ EN ROUTE BETWEEN ORIGIN/DESTINATION ☐ LOADING ☐ UNLOADING ☐ TEMPORARY STORAGE TERMINAL

27 LAND USE AT INCIDENT SITE ☐ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL ☐ AGRICULTURAL ☐ UNDEVELOPED

28 COMMUNITY TYPE AT SITE ☐ URBAN ☐ SUBURBAN ☐ RURAL

29 WAS THE SPILL THE RESULT OF A VEHICLE ACCIDENT/DERAILMENT? ☐ YES ☐ NO
IF YES AND APPLICABLE, ANSWER PARTS A THRU C

A ESTIMATED SPEED	B HIGHWAY TYPE ☐ DIVIDED/LIMITED ACCESS ☐ UNDIVIDED	C TOTAL NUMBER OF LANES ☐ ONE ☐ THREE ☐ TWO ☐ FOUR OR MORE	SPACE FOR DOT USE ONLY

FORM DOT F 5800.1 (Rev. 6/89) Supersedes DOT F 5800.1 (10/70) (9/1/76) THIS FORM MAY BE REPRODUCED

DOT Form 5800.1 - Hazardous Materials Incident Report

VII. PACKAGING INFORMATION: If the package is overpacked (consists of several packages, e.g. glass jars within a fiberboard box), begin with Column A for information on the innermost package.

ITEM	A	B	C
30 TYPE OF PACKAGING, INCLUDING INNER RECEPTACLES (e.g. Steel drum, tank car)			
31. CAPACITY OR WEIGHT PER UNIT PACKAGE (e.g. 55 gallons, 65 lbs.)			
32. NUMBER OF PACKAGES OF SAME TYPE WHICH FAILED IN IDENTICAL MANNER			
33. NUMBER OF PACKAGES OF SAME TYPE IN SHIPMENT			
34 PACKAGE SPECIFICATION IDENTIFICATION (e.g. DOT 17E, DOT 105A100, UN 1A1 or none)			
35 ANY OTHER PACKAGING MARKINGS (e.g. STC. 18/16-55-88, Y1.4/150/87)			
36 NAME AND ADDRESS, SYMBOL OR REGISTRATION NUMBER OF PACKAGING MANUFACTURER			
37 SERIAL NUMBER OF CYLINDERS, PORTABLE TANKS, CARGO TANKS, TANK CARS			
38. TYPE OF LABELING OR PLACARDING APPLIED			
39. IF RECONDITIONED OR REQUALIFIED — A REGISTRATION NUMBER OR SYMBOL			
39. IF RECONDITIONED OR REQUALIFIED — B DATE OF LAST TEST OR INSPECTION			
40. EXEMPTION/APPROVAL/COMPETENT AUTHORITY NUMBER, IF APPLICABLE (e.g. DOT E1012)			

VIII. DESCRIPTION OF PACKAGING FAILURE: Check all applicable boxes for the package(s) identified above.

41. ACTION CONTRIBUTING TO PACKAGING FAILURE

	A	B	C		A	B	C	
a.	☐	☐	☐	TRANSPORT VEHICLE COLLISION	☐	☐	☐	CORROSION
b.	☐	☐	☐	TRANSPORT VEHICLE OVERTURN	☐	☐	☐	METAL FATIGUE
c.	☐	☐	☐	OVERLOADING/OVERFILLING	☐	☐	☐	FRICTION RUBBING
d.	☐	☐	☐	LOOSE FITTINGS, VALVES	☐	☐	☐	FIRE/HEAT
e.	☐	☐	☐	DEFECTIVE FITTINGS, VALVES	☐	☐	☐	FREEZING
f.	☐	☐	☐	DROPPED	☐	☐	☐	VENTING
g.	☐	☐	☐	STRUCK/RAMMED	☐	☐	☐	VANDALISM
h.	☐	☐	☐	IMPROPER LOADING	☐	☐	☐	INCOMPATIBLE MATERIALS
i.	☐	☐	☐	IMPROPER BLOCKING	☐	☐	☐	OTHER _____

42 OBJECT CAUSING FAILURE

	A	B	C	
a	☐	☐	☐	OTHER FREIGHT
b	☐	☐	☐	FORKLIFT
c	☐	☐	☐	NAIL/PROTRUSION
d	☐	☐	☐	OTHER TRANSPORT VEHICLE
e	☐	☐	☐	WATER/OTHER LIQUID
f	☐	☐	☐	GROUND/FLOOR/ROADWAY
g	☐	☐	☐	ROADSIDE OBSTACLE
h	☐	☐	☐	NONE
i	☐	☐	☐	OTHER

43. HOW PACKAGE(S) FAILED

	A	B	C	
a	☐	☐	☐	PUNCTURED
b.	☐	☐	☐	CRACKED
c.	☐	☐	☐	BURST/INTERNAL PRESSURE
d.	☐	☐	☐	RIPPED
e.	☐	☐	☐	CRUSHED
f.	☐	☐	☐	RUBBED/ABRADED
g	☐	☐	☐	RUPTURED
h.	☐	☐	☐	OTHER _____

44 PACKAGE AREA THAT FAILED

	A	B	C	
a	☐	☐	☐	END, FORWARD
b	☐	☐	☐	END, REAR
c	☐	☐	☐	SIDE, RIGHT
d	☐	☐	☐	SIDE, LEFT
e	☐	☐	☐	TOP
f	☐	☐	☐	BOTTOM
g	☐	☐	☐	CENTER
h	☐	☐	☐	OTHER _____

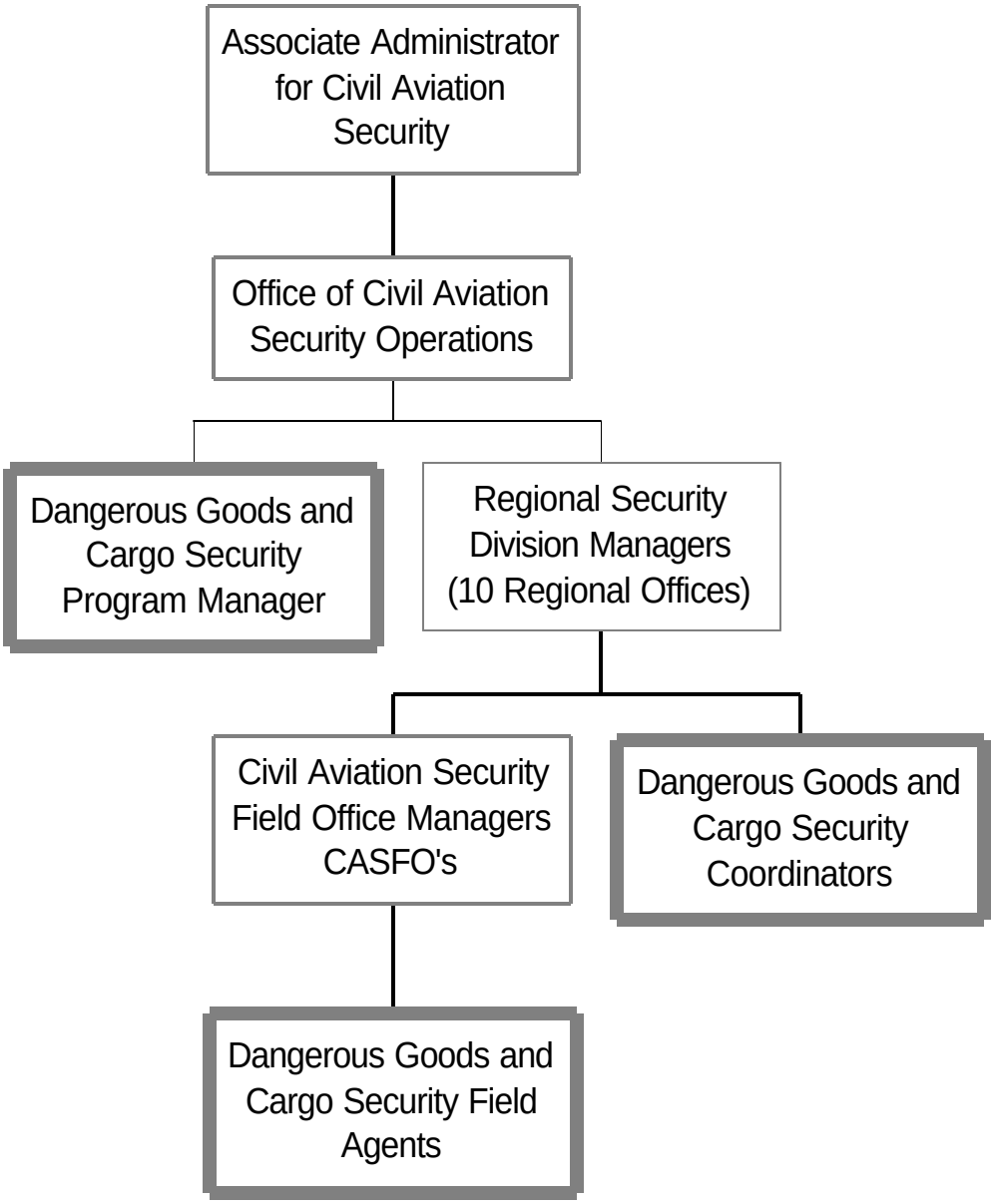
45 WHAT FAILED ON PACKAGE(S)

	A	B	C	
a	☐	☐	☐	BASIC PACKAGE MATERIAL
b	☐	☐	☐	FITTING/VALVE
c	☐	☐	☐	CLOSURE
d	☐	☐	☐	CHIME
e	☐	☐	☐	WELD/SEAM
f	☐	☐	☐	HOSE/PIPING
g	☐	☐	☐	INNER LINER
h	☐	☐	☐	OTHER

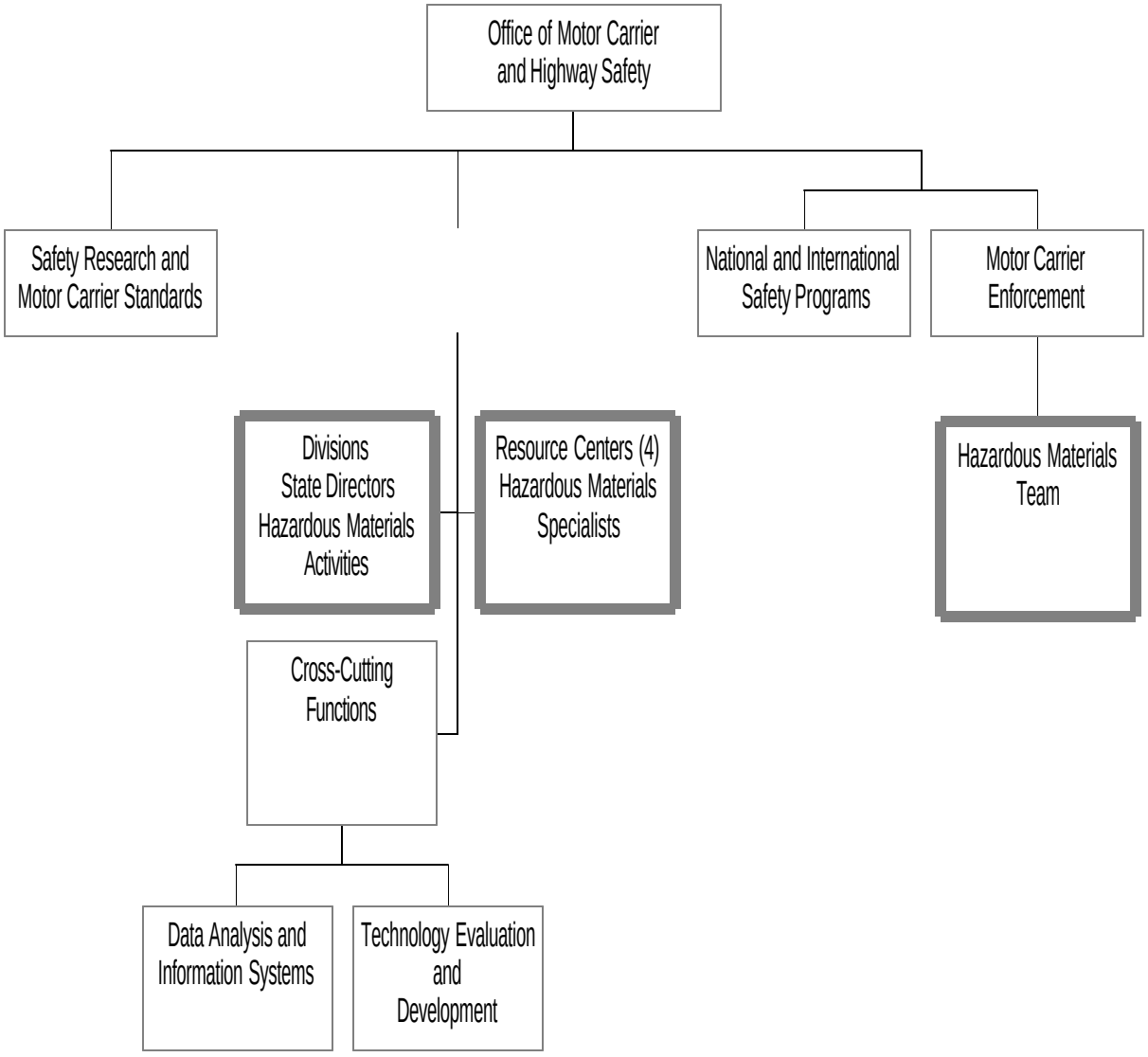
IX. DESCRIPTION OF EVENTS: Describe the sequence of events that led to incident, action taken at time discovered, and action taken to prevent future incidents. Include any recommendations to improve packaging, handling, or transportation of hazardous materials. Photographs and diagrams should be submitted when necessary for clarification. ATTACH A COPY OF THE HAZARDOUS WASTE MANIFEST FOR INCIDENTS INVOLVING HAZARDOUS WASTE. Continue on additional sheets if necessary.

46 NAME OF PERSON RESPONSIBLE FOR PREPARING REPORT	47 SIGNATURE	
48 TITLE OF PERSON RESPONSIBLE FOR PREPARING REPORT	49 TELEPHONE NUMBER (Area Code)	50 DATE REPORT SIGNED

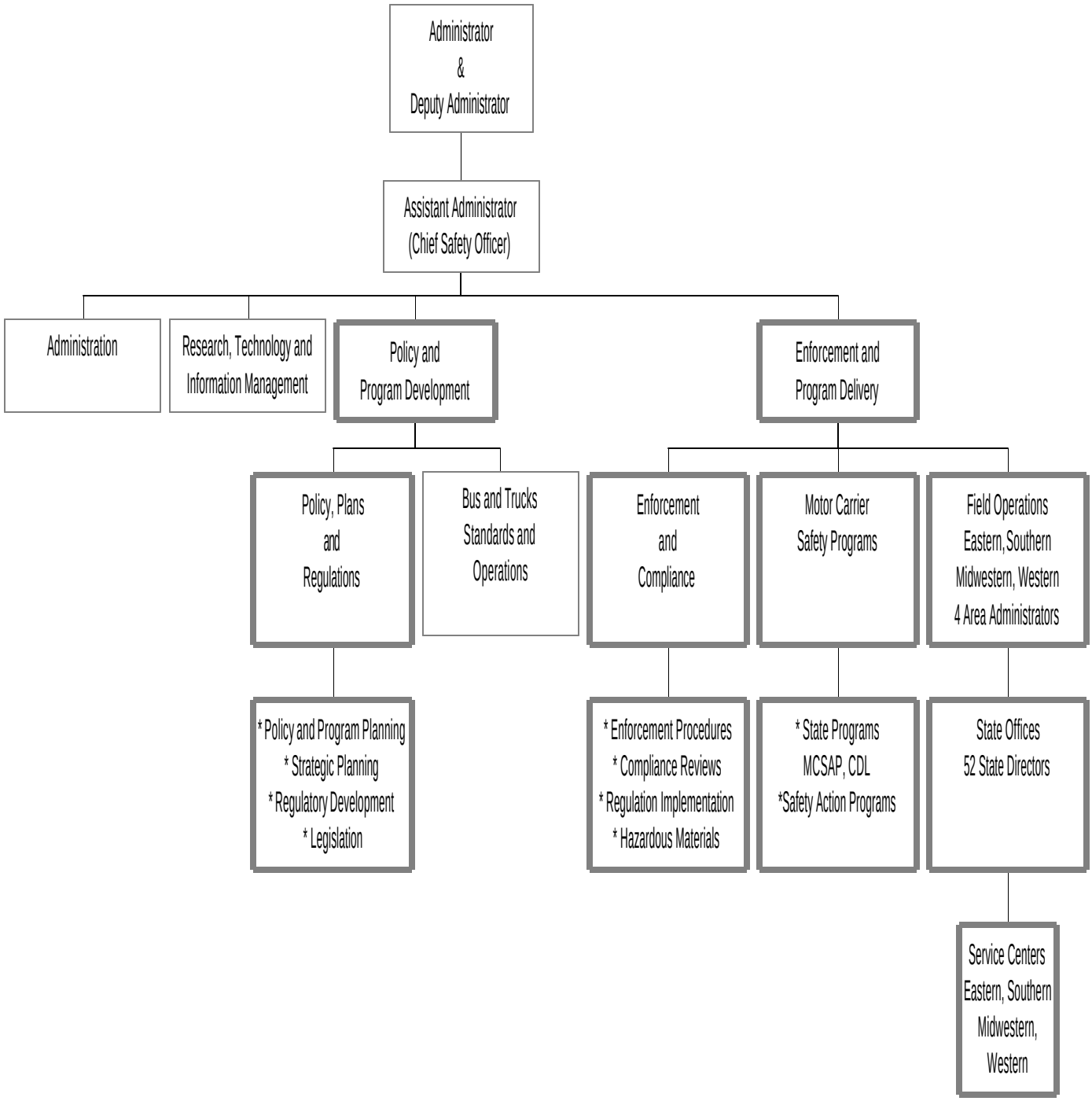
FEDERAL AVIATION ADMINISTRATION
OFFICE OF CIVIL AVIATION SECURITY
DANGEROUS GOODS PROGRAM



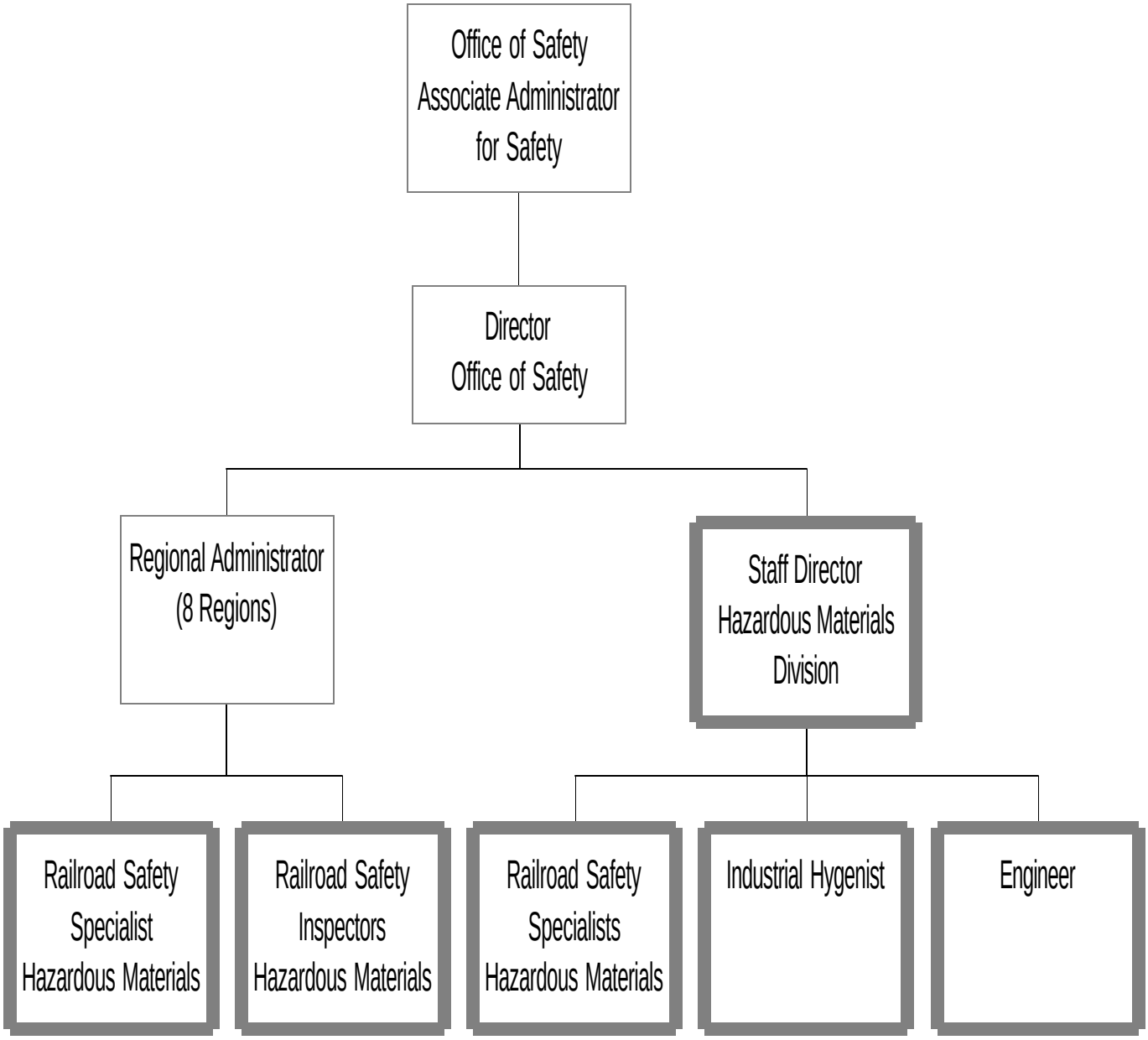
**FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION
ORGANIZATIONAL STRUCTURE FOR
HAZARDOUS MATERIALS PROGRAM PRIOR TO JANUARY 5, 2000**



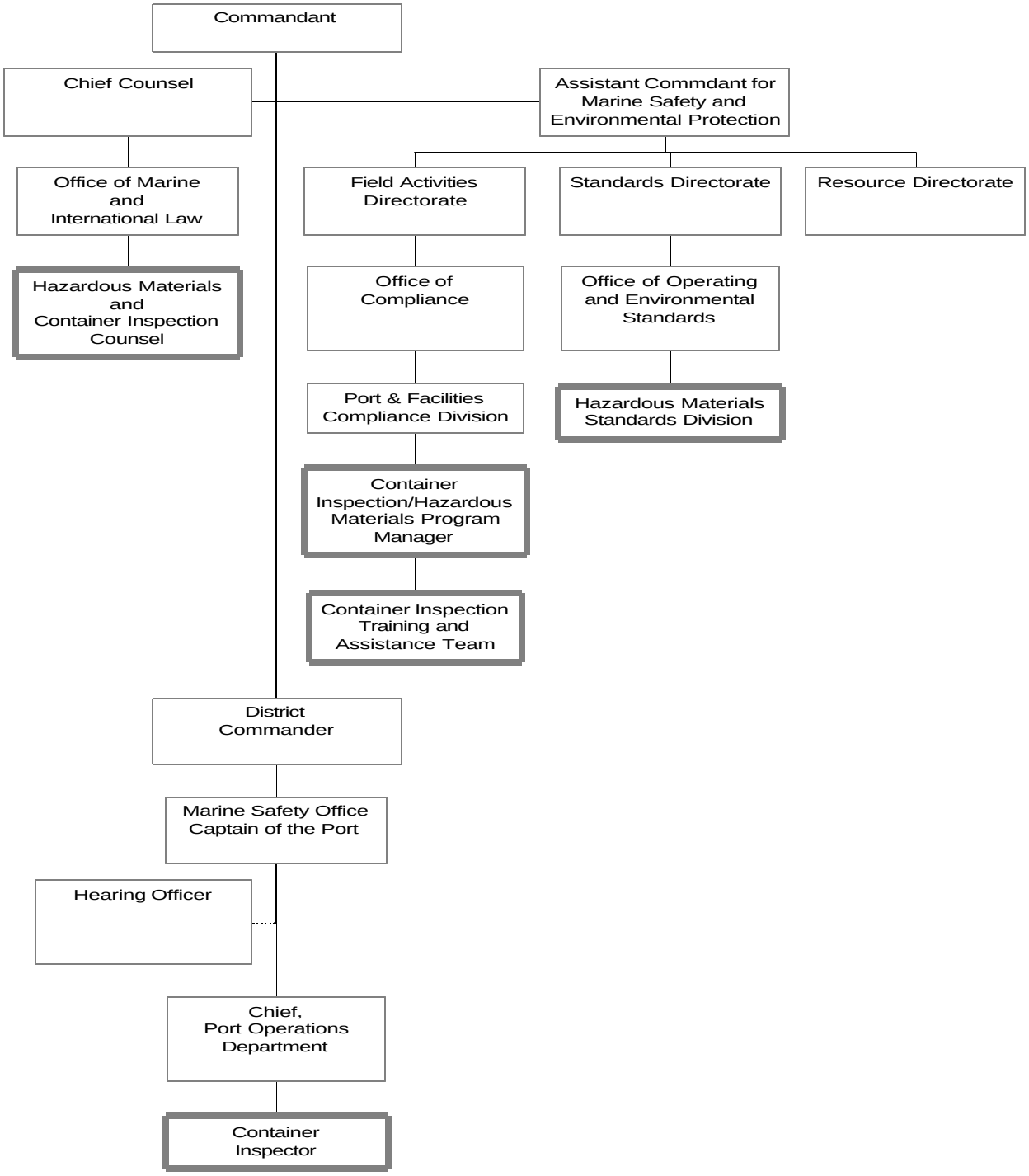
FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION
ORGANIZATIONAL STRUCTURE FOR
HAZARDOUS MATERIALS PROGRAM AS OF JANUARY 5, 2000



FEDERAL RAILROAD ADMINISTRATION
OFFICE OF SAFETY HAZARDOUS MATERIALS PROGRAM



UNITED STATES COAST GUARD
CONTAINER INSPECTION/HAZARDOUS MATERIALS PROGRAM



RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
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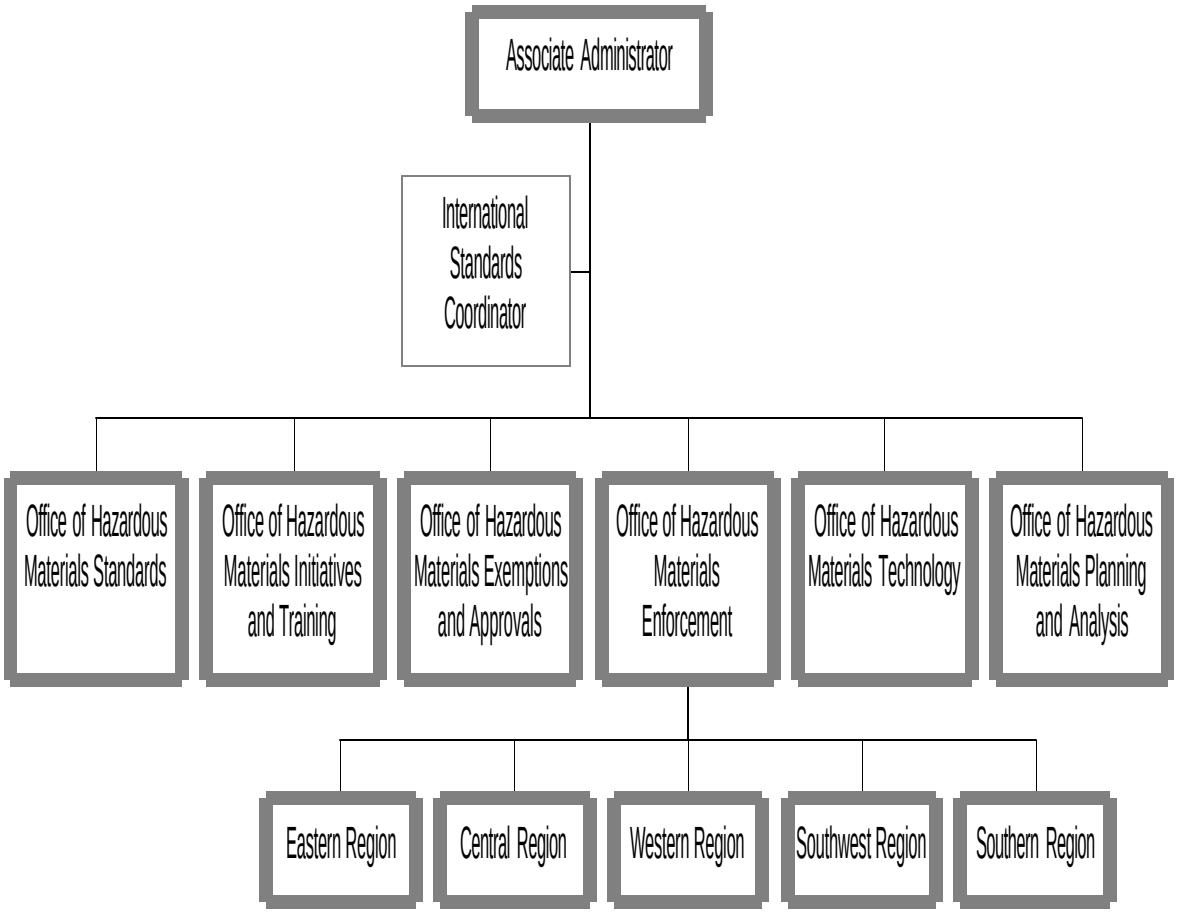

Description of Violation Categories Identified in Table 6

In 1998, DOT inspectors identified 96,474 violations of Hazardous Materials Regulations. Specific examples of the most frequently encountered violations in each of the broad categories identified in Table 6 in Chapter 6 of this report are summarized below.

49 CFR Part 107 – Hazardous Materials Program Procedures

Part 107 prescribes procedures RSPA's Associate Administrator of Hazardous Materials Safety and the Office of Chief Counsel use in carrying out their duties under the laws pertaining to the transportation of hazardous materials.

Violations of Part 107 were:

- Failure to submit registration for cargo tank motor vehicle manufacturer, repair facility or assembly activity.
- Failure to register as a hazardous materials shipper or carrier and pay the registration fee.
- Failure to have a copy of the Certificate of Registration or the registration number on a transport vehicle.

49 CFR Part 171 – General information, Regulations, and Definitions

Part 171 prescribes requirements of the Department of Transportation governing: the offering of hazardous materials for transportation and transportation of hazardous materials; the representation that a hazardous material is present in a package, container, rail car, aircraft, motor vehicle or vessel; the manufacture, fabrication, marking, maintenance, reconditioning, repair, or testing of packaging or a container presented, marked, certified, or sold for use in transporting of hazardous materials; and the use of terms and symbols prescribed for the marking, labeling, placarding, and description of hazardous materials and packagings used in their transport.

Violations of Part 171 were:

- Failure to immediately make the required telephonic notification of a hazardous materials incident.

- Failure to prepare and submit the required Hazardous Materials Incident Report when an unintentional release of hazardous materials occurred in transportation.
- Failure to comply with the provisions of the International Civil Aviation Organization Technical Instructions for the transportation of hazardous materials by aircraft.
- Failure to comply with the provisions of the International Maritime Dangerous Goods Code for the transportation of hazardous materials by vessel.
- Failure to comply with the provision of the Canadian Transportation of Dangerous Goods Regulations for the transportation of hazardous materials from Canada.

49 CFR Subpart 172.200 – Shipping Papers

Subpart 172.200 prescribes the manner in which each person who offers a hazardous material for transportation must describe the hazardous material on the shipping papers.

Violations of Subpart 172.200 were:

- Failure to provide a shipping paper with a shipment of hazardous materials.
- Failure to properly describe a hazardous material on a shipping paper.
- Failure to properly certify a hazardous materials shipping paper, including no certification, no signature, and incorrect or improper language description.
- Failure to meet the prescribed format requirements.
- Failure to properly certify a shipment for transportation by aircraft.
- Failure to include an exemption number in association with the shipping description when required.

49 CFR Subpart 172.300 – Marking

Subpart 172.300 prescribes the manner in which each package, freight container, and transport vehicle containing hazardous material must be marked.

Violations of Subpart 172.300 were:

- Failure to properly mark a package with the required shipping name or identification number.
- Failure to properly mark a package with conforming orientation arrows when liquid hazardous materials are contained in them.
- Failure to mark a transport vehicle with an identification number when required.
- Marking a package with a proper shipping name and identification number for hazardous materials when the package does not contain a hazardous material.
- Marking a package with an obscured or illegible shipping name or identification number.
- Failure to provide or affix identification numbers on placards, orange panels, or white square-on-point backgrounds.

49 CFR Subpart 172.400 – Labeling

Subpart 172.400 prescribes the manner in which each package or containment device must be labeled.

Violations of Subpart 172.400 were:

- Failure to affix a required label to a package.
- Affixing a hazardous materials warning label to a package, when a hazardous material was not present or the label did not represent the hazard of the material in the package.
- Failure to affix a required subsidiary hazard warning label to a package containing hazardous materials when required.
- Failure to properly affix a hazard warning label.
- Affixing a label or similar display on a package that conflicts with a required hazard warning label.

49 CFR Subpart 172.500 – Placarding

Subpart 172.500 prescribes the type of placarding that must be displayed on each side and each end of bulk packaging, freight container, unit load device, transport vehicle, or rail car containing any quantity of hazardous material.

Violations of Subpart 172.500 were:

- Failure to display a required placard.
- Displaying a placard that is not authorized or one that does not represent the hazard of the material being transported.
- Failure to display a required subsidiary hazard class placard.
- Displaying a placard which is obscured.
- Failure to provide or affix placards as required.
- Display of placards that do not meet prescribed specifications, format, color, or content.
- Display of a sign or other display that conflicts with a DOT hazard placard.

49 CFR Subpart 172.600 – Emergency Response Information

Subpart 172.600 prescribes requirements for providing and maintaining emergency response information during transportation of hazardous materials and at facilities where hazardous materials are loaded, stored incidental to transportation, or otherwise handled during any phase of transportation.

Violations of Subpart 172.600 were:

- Failure to provide emergency response information as required.
- Failure to include an emergency response telephone number on a shipping paper.
- Failure to monitor the emergency response telephone number while the hazardous material is in transportation.
- Providing an emergency response telephone number of a third party, when not authorized by the third party to do so.
- Failure to include the required information as part of the emergency response information.

49 CFR Subpart 172.700 – Training

Subpart 172.700 prescribes requirements for training of hazardous materials employees by hazardous materials employers.

Violations of Subpart 172.700 were:

- Failure to train a hazardous materials employee.

- Failure to comply with the recurrent training requirement for hazardous materials employees.
- Failure to test a hazardous materials employee.
- Failure to maintain records of training.
- Failure to certify that a hazardous materials employee has been properly trained and tested.
- Failure to ensure that training records and certifications are readily accessible.

49 CFR Part 173 – Shippers – General Requirements of Shipments and Packagings

Part 173 prescribes requirements for preparing hazardous materials for shipments by air, highway, rail or water, or any combination thereof; and inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials

Violations of Part 173 were:

- Offering hazardous materials for transportation that were not properly prepared for transportation.
- Offering hazardous materials in salvage drums which were not authorized, or which were improperly prepared.
- Failure to meet the provisions of Subpart 173.4 for a “small quantity” shipment of hazardous materials.
- Offering a packaging that was incompatible with the hazardous material.
- Offering hazardous materials for transportation in a packaging which is not authorized.
- Offering hazardous materials for transportation aboard an aircraft which did not meet the requirements of Subpart 173.27 - General requirements for transportation by aircraft.
- Using packaging that was not properly reconditioned, retested, or authorized for reuse.
- Packaging compressed gas in a cylinder that was damaged, out-of-test, or otherwise not suitable for transportation.

49 CFR Part 174 – Carriage by Rail

Part 174 prescribes requirements, in addition to those contained in parts 171, 172, 173, 179, and 180, to be observed when transporting hazardous materials in or on rail cars.

Violations of Part 174 were:

- Failure to inspect a hazardous material car before acceptance.
- Failure to expedite tank car shipments of hazardous materials.
- Acceptance of a hazardous materials car without shipping papers.
- Failure to possess a shipping paper during transportation.
- Transportation of a hazardous material car in a train without a document indicating the position in the train of each loaded, placarded car.
- Transporting a tank car without having the proper marking and placarding.
- Improper transportation of an Inter-Modal portable tank.
- Failure to properly unload a tank car.

49 CFR Part 175 – Carriage by Aircraft

Part 175 prescribes requirements, in addition to those contained in parts 171, 172 and 173, applicable to aircraft operators transporting hazardous materials aboard aircraft.

Violations of Part 175 were:

- Failure to properly accept and inspect a hazardous material shipment.
- Failure to properly secure hazardous materials packages within a cargo hold of an aircraft.
- Failure to display hazardous materials warning signage within the airport terminal(s) or cargo facility.
- Exceeding the 25kg weight limitations when loading an aircraft in non-accessible locations.
- Failure to train airline personnel.

49 CFR Part 176 – Carriage by Vessel

Part 176 prescribes requirements, in addition to those contained in parts 171, 172, and 173, when transporting hazardous materials by vessel.

Violations of Part 176 were:

- Transporting a hazardous material aboard a vessel, without a properly prepared Dangerous Goods Manifest that lists only those materials subject to the requirements of 49 CFR or the International Maritime Dangerous Goods Code.
- Failure to properly block or brace hazardous materials within a transport vehicle or freight container aboard a vessel to prevent movement in any direction.
- Failure to segregate hazardous materials by distance or the presence of one or more steel bulkheads or decks, between incompatible hazardous materials.
- Failure to ensure the structural serviceability of freight containers and vehicles carrying Class 1 (explosive) materials on ships.
- Failure to meet the requirements applicable to motor vehicles or mechanical equipment powered by internal combustion engines when carried as cargo on a vessel.

49 CFR Part 177 – Carriage by Public Highway

Part 177 prescribes requirements, in addition to those contained in parts 171, 172, 173, 178 and 180, to be observed when transporting hazardous materials by motor vehicle.

Violations of Part 177 were:

- Accepting an improperly prepared hazardous material for transportation.
- Failure to comply with applicable Motor Carrier Safety regulations in 49 CFR parts 390 through 397.
- Failure to provide driver training to the operator of a motor vehicle transporting hazardous materials.
- Accepting a hazardous material for transportation without a properly prepared shipping paper.
- Failure to maintain a shipping paper or emergency response information as required.
- Failure to properly secure a package containing a hazardous material.
- Transporting a hazardous material displaying a POISON label with foodstuffs.
- Failure to properly segregate a hazardous material from another hazardous material.

49 CFR Part 178 – Specifications for Packagings

Part 178 prescribes the manufacturing and testing specifications used for the transportation of hazardous materials in commerce.

Violations of Part 178 were:

- Failure of a packaging manufacturer to provide proper closing instructions.
- Marking packaging as meeting the requirements of the HMR when the packing does not meet either specification or performance requirements.
- Marking a packaging with a specification when the packaging was not properly manufactured or tested.
- Failure to maintain the required test records.
- Manufacturing or certifying a specification cargo tank as meeting the requirements of the HMR, when the manufacturer is not properly registered or does not otherwise meet the requirements.

49 CFR Part 179 - Specifications for Tank Cars

Part 179 prescribes requirements for construction of tank cars for pressure and non-pressure service, multi-unit tank car tanks, cryogenic liquid tanks, and seamless steel tanks.

Violations of Part 179 were:

- Failure of pressure relief devices.
- Improper specification marking of tank cars.
- Failure in the general specification of pressure tank cars.
- Failure in the general specification of non-pressure tank cars.

49 CFR Part 180 – Continuing Qualification and Maintenance of Packagings

Part 180 prescribes requirements pertaining to the maintenance, reconditioning, repair, inspection and testing of packagings, and other functions having an effect on the continuing qualification and use of a packagings.

Violations of Part 180 were:

- Failure to properly conduct continuing qualification, maintenance, or periodic retesting of packaging used for hazardous materials.

- Failure to conduct or conduct properly the required requalification or periodic retests of packaging for hazardous materials.
- Failure to maintain the required records for the requalification, maintenance, or periodic tests of packaging for hazardous materials.
- Failure to properly repair or modify packaging for hazardous materials.

49 CFR Part 180. – Subpart F – Qualification and Maintenance of Tank Cars

Subpart F prescribes the requirements for maintenance and testing of tank cars.

Violations of Part 180 Subpart F were:

- Failure to properly mark the tank car with the date[s] of inspection and testing.
- Failure to properly report and maintain records in accordance with the record retention requirements.

Calendar Year 1998 Agency Inspections

FAA Activities

FAA conducted 3,559 inspections in calendar year (CY) 1998 including 3,119 air carriers, 232 indirect air carriers and 208 FAA authorized repair stations. FAA's "comprehensive assessments" include a complete review of compliance with all relevant rules and standards. A comprehensive air carrier assessment, such as United Airlines operations at Chicago-O'Hare International Airport for example, would involve the systematic evaluation of an entire operating facility. Comprehensive air carrier assessments take 15 to 20 hours, which includes preparation time:

- reviewing previous assessment and enforcement history of the air carrier;
- reviewing hazardous materials training programs and related training records;
- monitoring carriers' acceptance procedures for hazardous materials shipments;
- inspecting hazardous materials packages to ensure shipper compliance with the HMR and International Civil Aviation Organization (ICAO);
- observing storage, handling, loading and securing of hazardous materials packages within the air cargo facility and aboard aircraft;
- reviewing shippers' declarations located in the air carriers' 90 day file;
- reviewing the air carriers Store Department to ensure aircraft replacement parts containing hazardous materials are being properly packaged for shipment; and
- assessing notification to flight crews that hazardous materials are aboard a particular aircraft.

FAA also conducted, but did not track, shipper assessments in 1998 that review one or more areas of compliance and are referred to by FAA as "supplemental assessments." To track these assessments FAA is developing an automated shipper assessment-tracking module is being developed to add to the existing Airport and Air Carrier Inspection Reporting System.

FAA initiated 257 enforcement actions as a result of assessments conducted in 1998.

FAA also conducted 1500 on-site investigations of incidents or discrepancies in 1998. An incident, as defined by 49 CFR Parts 171.15 and 16, involves the unintentional release of hazardous materials. Discrepancies, defined under 49 CFR 175.31, involve an undeclared or improperly prepared hazardous materials shipment. On-site investigations involve the collection of information and evidence from the carrier or shipper directly or indirectly (for example, photographs, air waybills, statements, and bills of lading) in order to determine if violations of the HMR or ICAO occurred. Depending on the complexity of the incident or discrepancy, an average investigation could take a few hours, days, or weeks to complete.

1,386 enforcement actions were initiated as a result of on-site investigations. FAA enforcement actions can be categorized as administrative or legal. Administrative action is a letter of warning or correction; and legal enforcement action is a Notice of Proposed Civil Penalty Assessment.

FMCSA Activities

In FY 1998, FMCSA employees conducted 1,650 compliance reviews of hazardous materials carriers. In addition, through funding provided by the $80 million MCSAP grant program, state employees conducted 444 compliance reviews and about 133,000 roadside inspections of motor carriers transporting hazardous materials. Compliance reviews are comprehensive inspections conducted at a carrier's office and include driver qualifications, driver hours of service records, vehicle maintenance and inspection records, financial records, and handling of hazardous materials (practices and procedures). A compliance review takes approximately 16 to 20 hours to complete. Of which at least 5 hours are devoted to hazardous materials activities. After the compliance review has been completed, another 16 hours usually is required if an enforcement case is initiated. Depending upon the severity of the violation, additional time maybe required to for preparation of out-of service orders, or attendance at a hearing.

State personnel usually conduct roadside inspections at weigh stations or highway rest areas. There are five levels of roadside inspections ranging from a level I, which is the most comprehensive and includes a complete review the driver's records and a thorough vehicle mechanical safety check, to a level V which is a limited inspection of the driver only. On average a roadside inspection takes approximately 30 minutes. During 1998, state employees performed 65,585 level I; 44,299 level II; 20,786 level III; 487 level IV; and 2,517 level V inspections. In addition, state personnel can perform special or terminal operations inspections.

FMCSA and States initiated over 16,500 enforcement actions in 1998 including 165 enforcement actions taken by FMCSA as a result of compliance reviews. All enforcement actions initially involve civil penalty assessments. Hazardous materials violations are calculated using the Hazardous Material Uniform Fine Assessment software program. Depending on whether or not the violator requests a hearing the final settlement may result in monetary or non-monetary penalty. Non-monetary may include the use of consent orders or other agreements between FMCSA and the party subject to enforcement action.

FMCSA does not have a process for tracking or recording hazardous material incident or accident investigations. However, during 1998 FMCSA conducted at least nine on-site hazardous materials incidents or accidents investigations. Significant accidents and/or incidents are those that result in multiple fatalities, numerous injuries, high property damage or any combination thereof. Also investigated are hazardous materials incidents that result in unusual interest such an explosion and substantial fire. The FMCSA Director for the state in which the incident/accident occurs makes a determination if an investigation is necessary to gather evidence on-site, to determine the cause of the incident, and the need to prepare an report of investigation. Both significant incidents and accident/incidents are investigated.

FRA Activities

FRA conducted a over 98,000 hazardous materials inspections in 1998 including 71 multi-modal inspections, 134 tank car manufacturers and repair facilities, 3,600 shippers of hazardous materials, 5,100 carriers and freight forwarders, and over 89,000 inspections of hazardous materials rail cars, intermodal portable tanks, and various other containers.

Tank car manufacturers and repair retest facilities has become an integral part of safety assurance. Title 49 CFR Subpart 179.7 requires each tank car facility to have a quality assurance program. Inspections of these facilities can usually be accomplished within a day.

Shipper inspections take at least half-day. High volume shippers require more time and are inspected at more frequent intervals. An inspection of a large shipper may take as long as an entire workweek.

Freight forwarder inspections are usually conducted as an ancillary inspection to rail intermodal inspections when evidence is uncovered suggesting the freight

forwarder violated a regulation. Freight forwarder inspections usually require 2 to 4 hours.

Inspection of tank cars is done at shipper or consignee facilities, rail yards, sidings, interchange points, and various other locations. Inspection of a single tank car averages ten minutes but could be longer if non-compliant conditions are found or the car requires particular attention. Rail cars other than tank cars usually require approximately 10 minutes to inspect.

Intermodal facility inspections take a day to obtain documentation, conduct the inspection, and write a report. Enforcement case preparation, if necessary, will add to the time. Inspection of Container on Flat Car or Trailer on Flat Car usually takes approximately 10 minutes to complete.

FRA inspections of "waybilling facilities" include evaluation of training records, special instructions for hazardous materials, yard inspections of railcars, car handling, train placement of hazardous materials cars, and acceptance and interchange (between carriers) of cars. These inspections routinely require approximately 2 hours per inspection.

FRA initiated 325 and closed 349 hazardous materials enforcement cases during 1998. This number reflects both cases initiated in past years and new cases finalized in 1998. FRA primarily uses civil penalties and letters of warning to impose compliance. FRA will also stop shipments until unsafe hazardous materials conditions are corrected.

FRA does not separately track hazardous materials incident investigations from all other accident investigations. On-site incident investigations require the inspector to thoroughly examine all packagings involved in an effort to determine the level of compliance with the packaging specification, marking, labeling, and documentation requirements, and to determine the cause of a package failure if one is identified. Incident investigations may be conducted as a *primary* investigation if extensive damage, evacuation, major injury or a fatality occurs, or as an *ancillary* investigation conducted during an inspector's routine inspection at a shipper or carrier facility for all other incidents. Average incident investigations take approximately 5 hours to complete, but catastrophic incidents have taken several weeks to complete.

RSPA Activities

RSPA conducted approximately 1,700 inspections in 1998. The primary focus of RSPA inspections is ensuring compliance with packaging specifications, packaging testing requirements, and exemptions and approvals. RSPA inspectors also examine hazardous materials shipments for proper packaging, classification, marking, labeling, and shipping documentation. Inspections are conducted at package manufacturing facilities; facilities involved in retesting, reconditioning, and repairing packages such as cylinders or metal drums; shipper facilities; and transportation interchange points such as ports. RSPA inspectors also purchase packaging and packaged hazardous materials on the open market and have independent labs or the Army conduct tests for compliance with the regulations.

RSPA revived its package-testing program in 1996. Under an interagency agreement with the U.S. Army Materiel Command Logistics Support Activity, Packaging, Storage, and Containerization Center at Tobyhanna, Pennsylvania, RSPA began to purchase packaging for testing. RSPA's testing focuses on packages designed and marked for hazardous materials in Packing Group I (the most stringent packaging requirement), with high specific gravity, and high internal pressures. Before testing is performed, RSPA obtains the manufacture design qualification test reports and manufacturer's package closing instructions. RSPA notifies the manufacturer of any package that fails and initiates enforcement actions if warranted.

In addition to package testing, RSPA conducts a materials testing program to respond to complaints about misclassification. For example, misclassification of a material as a primarily flammable versus a corrosive would effect its packaging characteristics. In this case, RSPA inspectors purchase small packaged samples of hazardous materials for laboratory analysis.

RSPA closed 783 enforcement cases in 1998 reflecting both cases initiated in prior years and new cases finalized in 1998. RSPA is the only Operating Administration to use administrative tickets as a means of facilitating monetary civil penalty enforcement action closure. Tickets are usually issued for non-serious violations, which include failure to prepare a written report of hazardous materials incident as required by 49 CFR Subpart 171.16. RSPA does not have a process for tracking or recording incident or accident investigations, since their participation is dependent upon invitation by applicable Operating Administration.

Coast Guard Activities

The Coast Guard conducted 8,899 inspections in 1998. These included 3,656 intermodal freight container inspections on the waterfront and 5,243 freight vessel examinations (includes both U.S. and foreign flag vessels). Intermodal freight container inspections include an examination of the shipping papers, container Safety Approval Plate, structural condition of the container, container placarding, and stowage, segregation, labeling and packaging of the hazardous materials within the container.

Freight vessel examinations ensure compliance with all the applicable provisions in Code of Federal Regulations Titles 33, 46, and 49. With respect to the HMR, the following areas are examined during a freight vessel examination: hazardous materials training records; the dangerous cargo manifest; and the marking, labeling, placarding, stowage, segregation and securing of both packaged and containerized cargo.

A 1994 Memorandum of Understanding between the Coast Guard and the National Cargo Bureau, Inc. (NCB) established a cooperative container inspection effort, and defined the services each organization would provide. Per the agreement, the Coast Guard accepts NCB Certificates of Loading as *prima facie* evidence of compliance with HMR. Consequently, Coast Guard container inspectors need not re-inspect hazardous material containers that have NCB Certificates of Loading. In 1998 NCB certified the loading of 2,778 containers.

The Coast Guard also conducted 443 investigations involving hazardous materials in 1998, 206 as a result of reported releases of hazardous materials and 237 because of violations discovered during inspections. Inspections of intermodal shipments of hazardous materials may involve a shipper, freight consolidators, freight forwarders, carriers, waterfront facilities, and import or export brokers and agents. When violations are discovered, each party's role in the shipments is investigated to determine whom to hold responsible

The Coast Guard initiated 829 enforcement actions in 1998 including 191 civil penalty cases, 46 letters of warning, and 592 detention actions that stop the movement the freight until unsafe conditions are corrected. Coast Guard does not maintain a formal tracking or reporting system specifically for incident or accident investigations.

Department of Transportation

HAZARDOUS MATERIALS PROGRAM EVALUATION
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DEPARTMENTWIDE PROGRAM EVALUATION OF THE HAZARDOUS MATERIALS TRANSPORTATION PROGRAMS

FINAL REPORT

MARCH 2000

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